EXHIBIT B

SOUTHERN DISTRICT OF WEST VIRGINIA
AT CHARLESTON

IN RE: ETHICON, INC., PELVIC REPAIR SYSTEM PRODUCTS LIABILITY LITIGATION **THIS DOCUMENT RELATES TO WAVE 1**	**Master File No. 2:12-MD-02327** **JOSEPH R. GOODWIN** **U.S. DISTRICT JUDGE**

RULE 26 EXPERT REPORT OF JIMMY W. MAYS

I. QUALIFICATIONS

Jimmy W. Mays

In 1979, I received my bachelor of science (BS) in Polymer Science from the University of Southern Mississippi. My CV is attached at Exhibit A. After receiving my B.S. from the University of Southern Mississippi, I started my graduate studies in Polymer Science at the University of Akron, the largest and arguably the best polymer science program in the country, where I received my Ph.D. in Polymer Science in 1984. The title of my Ph.D. thesis is "Characteristic Ratios of Model Polydienes and Polyolefins". This work involved the synthesis of well-defined polydienes of controlled microstructure and the subsequent hydrogenation of these materials to obtain model polyolefins, including polypropylene. The conformational characteristics of these materials were studied by a variety of characterization techniques, including gel permeation chromatography (GPC), differential scanning calorimetry (DSC), nuclear magnetic resonance spectroscopy (NMR), and Fourier transform infrared spectroscopy (FTIR).

From 1983-1987, I worked as a research chemist at Hercules Incorporated at their central R&D facility in Wilmington, Delaware. At the time, Hercules was one of the largest producers of polypropylene in the world. For most of my time there I worked in a Polymer Characterization Group, where we performed molecular weight and molecular size measurements on a wide range of polymers, including water soluble polymers and

polyelectrolytes, semi-crystalline polyolefins, especially polypropylene, and organosoluble polymers and copolymers. GPC was used extensively in this work. During this time, I was also the official "technical liaison" between the Hercules Fibers Technical Center (FTC) in Oxford, GA, where polypropylene fiber was produced, and Hercules central R&D facility. My responsibility was to visit FTC regularly and help the workers at FTC solve their technical problems by using central research expertise and facilities.

In 1988, following my employment at Hercules Incorporated, I joined the faculty at the University of Alabama at Birmingham (UAB) as an Assistant Professor in the Department of Chemistry. In 1992, I was promoted to Associate Professor and in 1995 was promoted to Professor of Chemistry. A major focus of my research activities at UAB was on polymeric biomaterials.

I am currently a Distinguished Professor of Chemistry at the University of Tennessee. I am also a Distinguished Scientist at the Oak Ridge National Laboratory and continue to serve as an Adjunct Professor at UAB. I also hold an appointment as Professor in the University of Tennessee, Institute of Biomedical Engineering. For the last thirty plus years, my research has focused on the synthesis and analytical characterization of linear and branched polymers and copolymers, including polypropylene. I have developed new polymeric materials for a host of applications, including new elastomers, new polymeric membranes for water purification and fuel cells, and new biomaterials.

I have published about 380 peer-reviewed papers in various scientific journals. I would estimate that well over half of these papers involve the use of GPC to characterize polymer average molecular weights and molecular weight distributions. The great majority also rely on methods including spectroscopy, microscopy, and mechanical properties measurements to characterize the polymers. These publications include work on polypropylene.

I, with Dr. Howard Barth, edited the book *Modern Methods of Polymer Characterization*, an often cited book on polymer characterization techniques, including GPC (Barth HG, Mays JW (Eds.), *Modern Methods of Polymer Characterization*, Wiley-Interscience (1991)) ("Barth and Mays"). I have also written invited chapters for the *Handbook of Polyolefins*, both the first edition in 1993 [1] and the second edition in 2000 [2], on characterization of polyolefins, including polypropylene. I am presently under contract with John Wiley & Sons to edit a 2nd edition of *Modern Methods of Polymer Characterization*.

I have worked extensively in the area of polymeric biomaterials, with many peer reviewed papers, a patent, and another patent pending, and I was a member of the Society of Biomaterials for several years. My work in this area includes development of novel bone cements, dental biomaterials, tissue engineering, drug delivery systems, surgical sealants, and polypropylene pelvic mesh.

Throughout my professional career I have received numerous honors and awards. In 2001 I received the Caroline P. and Charles W. Ireland Prize for Scholarly Distinction (UAB's highest award to faculty in the arts and sciences). In 2001, I was named University Scholar at UAB (honorary faculty status granting maximum latitude in conducting interdisciplinary teaching and research). Other recent honors include: 2003 Arthur K. Doolittle Award, Polymeric Materials Science and Engineering Division, American Chemical Society; 2006 Named Honorary Professor by East China University of Science and Technology; 2007 Chair, Polymers West Gordon Research Conference; 2008 Distinguished Service Award, ACS Division of Polymer Chemistry; 2009 Bayer Lectures on Polymers, Cornell University; 2009 Southern Chemist Award of ACS (top chemist in Southeastern US); 2010 Named Founding POLY Fellow, ACS Division of Polymer Chemistry; 2011 Herman Mark Senior Scholar Award, ACS Division of Polymer Chemistry; 2011 Outstanding Alumni Award, University of Akron; 2011 Fellow, American Chemical Society; 2012 Fellow, ACS Division of Polymeric Materials Science and Engineering; 2012 Fellow, American Association for the Advancement of Science; 2013 Bill & Melinda Gates Foundation Grand Challenges Explorations Award; 2014 Fellow of the Royal Society of Chemistry.

Through my tenure as an academic faculty member at both UAB and the University of Tennessee, I have taught numerous graduate-level and undergraduate-level Polymer Chemistry and Polymer Materials classes. For 14 years at UAB I taught a two semester course on Polymeric Materials which was taken annually by upper level undergraduates and graduate students in Chemistry, Materials Science and Engineering, and Biomedical Engineering. In this class, the theory and principles of polymer characterization techniques (GPC, spectroscopy, microscopy, mechanical properties) were taught. There were required, even for graduate students, laboratories on SEC and on spectroscopy. This fall, I developed and taught a new laboratory based course, Advanced Techniques in Polymer Synthesis and Characterization, taken by 2nd year graduate students pursuing the Ph.D. in polymer chemistry.

I am a member of the American Chemical Society and its PMSE (Polymeric Materials Science and Engineering) and POLY (Polymer Chemistry) Division, and I am a member of the American Association for the Advancement of Science and the Society for Biomaterials. I have at times in my career been a member of the American Physical Society.

I currently serve as an Associate Editor for the *International Journal of Polymer Analysis and Characterization*. I previously served as an editor of *European Polymer Journal*. I serve or have served on the editorial advisory boards of various journals including, *Macromolecules*, *Polymer Bulletin*, *Journal of Applied Polymer Science*, and *European Polymer Journal*. I also review approximately 50 papers/proposals annually for various journals and agencies including *Journal of Applied Polymer Science, Macromolecules, Journal of Polymer Science, Journal of Physical Chemistry, Journal of Chemical Physics, Journal of the American Chemical Society, Angewandte Chemie, Polymer Degradation and Stability, Soft Matter*, National Science Foundation, Department of Defense, American Chemical Society/Petroleum Research Fund, Department of Energy, and others.

Since 2000, I have been a member of the Governing Board for the International Symposium on Polymer Analysis and Characterization (ISPAC). ISPAC annually holds an international meeting that addresses forefront issues in all areas of polymer characterization. I have previously chaired and hosted an ISPAC Meeting in Oak Ridge, TN.

The materials I considered in preparing the statements below are listed in Exhibit B.

II. BACKGROUND

Ethicon sells permanently implantable polypropylene-based meshes intended to treat Stress Urinary Incontinence (SUI) and Pelvic Organ Prolapse (POP). These devices are manufactured from Prolene resin, which is Ethicon's proprietary blend of polypropylene that was originally developed for use as a suture material in the 1960's and is currently used to manufacture all of Ethicon's polypropylene-based mesh products. These products include Prolene Mesh, Gynemesh PS, Gynecare Prolift, Gynecare Prolift + M, Prosima, Gynecare TVT System, Gynecare TVT Retropubic System, Gynecare TVT Obturator (TVTO), Gynecare TVT Abbrevo, Gynecare TVT Secur, and Gynecare TVT Exact. This report is an assessment of the characteristics and performance of Prolene, the polypropylene, and the mesh, cut into various shapes and

configurations for different anatomic sites and insertion methods, and utilized in the listed Ethicon devices used to treat Stress Urinary Incontinence (SUI) and Pelvic Organ Prolapse (POP).

This report focuses on the following key issues: the chemical structure and properties of polypropylene, degradation of polypropylene by thermo-oxidative processes and *in vivo*, and effect of *in vivo* degradation on the polypropylene implant.

III. SUMMARY OF OPINIONS

1) It has been well understood for many years that polypropylene is susceptible to oxidation and it degrades by an oxidative mechanism in the body, resulting in chain scission and diminished mechanical properties (reduced compliance and brittleness). These facts are clearly documented in the peer reviewed scientific literature. Ethicon did not take into account polypropylene's propensity for oxidation during design of its various Prolene based mesh products.

2) The mesh is intended to last for the lifetime of the patient, but the addition of antioxidants to the Prolene polypropylene does not permanently prevent mesh degradation, and thus it is not possible to guarantee that the mesh will function properly after implantation;

3) Ethicon was aware of the oxidation of Prolene prior to the introduction of the transvaginal mesh devices sold by Ethicon to the marketplace, but the company did not consider the risks associated with polypropylene oxidation on the stability of the Prolene mesh, to the detriment of patients implanted with the various devices made from the polypropylene resin;

4) Foreign body reaction to the mesh *in vivo* leads to oxidation, chain scission, reduction in molecular weight, embrittlement, degradation, flaking, pitting, and cracking;

5) PP mesh is not inert and its properties change after implantation, which can lead to adverse events in an implantee.

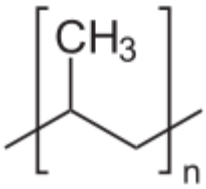
6) Thus, the Prolene mesh is unreasonably dangerous, defective and is not suitable to serve as the permanent implants that they have been represented by Ethicon to be.

IV. OPINIONS

Section 1.0 Polypropylene:

Overview

Polypropylene is a synthetic polymer made by addition polymerization of the monomer propylene, CH_3-CH=CH_2.



Scheme 1: The repeating unit in polypropylene

Propylene is a byproduct of oil refining, to produce gasoline, and natural gas processing. During oil refining, ethylene, propylene, and other compounds are produced as a result of "cracking" larger hydrocarbon molecules to produce smaller hydrocarbons that are more in demand. Ethylene and propylene are used in vast quantities to produce polyethylene and polypropylene, the two largest volume plastics in the world (currently about 60% by weight of the world's polymer production). Polypropylene is a thermoplastic polymer (meaning it softens and flows upon heating above its melting point), allowing it to be formed into useful objects such as fibers, used in a wide range of applications including textiles, ropes, fibers and fishing line, carpets, stationery, plastic parts, plastic containers, films and packaging, laboratory equipment, automotive components, etc.

Classifications of Polypropylene

Polypropylene may be classified according to its stereochemistry or tacticity. By far the most important type of polypropylene is isotactic polypropylene, which is made using Zeigler-Natta or metallocene catalysts. Isotactic polypropylene, because of the regular orientation of the methyl (-CH_3) substituents on each repeating unit, is a semi-crystalline polymer with a melting

point of about 165 °C. This high melting temperature allows polypropylene to be autoclaved, and the crystallinity present in the polymer imparts dimensional stability and solvent resistance.

Additives in Polypropylene

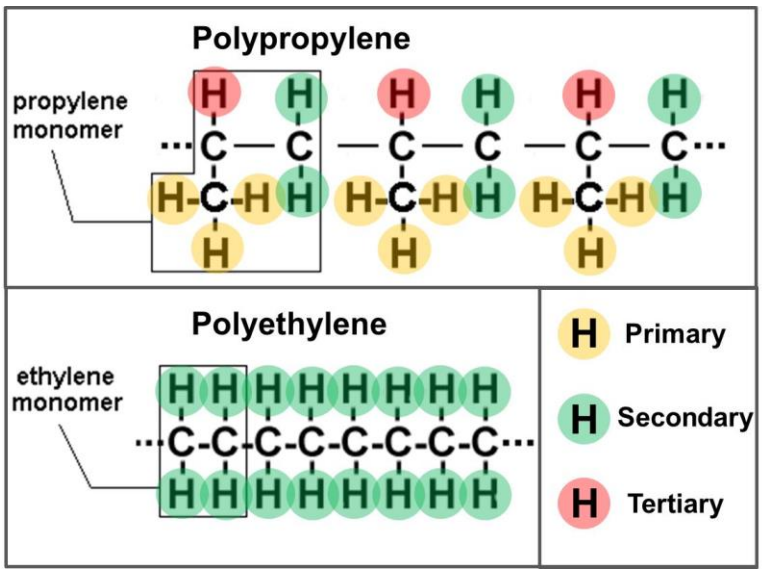
Commercially produced polypropylene is almost never pure polypropylene. A range of additives are added [3] depending on the anticipated application of the material. Common additives include antioxidants, UV stabilizers, antistatic agents, electrically conducting additives, fillers, pigments and colorants, lubricants, nucleating agents, polymer processing aids such as fluoroelastomers, and transition metal scavengers such as calcium stearate in order to deactivate residual catalyst (which is not removed from the polypropylene).

Degradation of Polypropylene

Polypropylene is highly susceptible to oxidative degradation, which can reduce the molecular weight of the polymer and diminish mechanical properties. Such oxidation occurs even at ambient temperature, although it is accelerated at higher temperatures, and it leads to a rapid deterioration of the physical properties over a period of weeks [3,4]. While all polyolefins are susceptible to oxidative degradation, polypropylene is the most susceptible – Vasile states [ref 3, p. 517] that "…PP products could not even exist without the addition of stabilizers." Her meaning reflects the fact that PP is so unstable in the presence of oxygen or other oxidizing chemical species that products made of PP would lose their mechanical integrity so quickly as to be unusable. Thus, antioxidants and other stabilizing additives are nearly always added to polypropylene.

Mechanism of Oxidative Degradation of Polypropylene

All polyolefins, including polyethylene and polypropylene, are susceptible to oxidation. Oxidative degradation of these hydrocarbon polymers should come as no surprise to any scientist or engineer that has taken second year college chemistry, because they are members of the family of hydrocarbons known as alkanes. Oxidative degradation of alkanes is a fundamental reaction that is taught in every organic chemistry textbook [4]. These oxidation reactions involve oxygen or other oxidizing chemical species attacking carbon-hydrogen bonds in the polyolefins. In polyolefin chemical structures, hydrogens are classified as primary, secondary, or tertiary depending upon where the carbon they are connected to is located in the structure. The schematic below shows the polypropylene chemical structure with primary, secondary and tertiary hydrogen atoms indicated.



Scheme 2: Structures of Polypropylene and Polyethylene Identifying Primary, Secondary and Tertiary Hydrogen Atoms.

The tertiary hydrogens present on each repeating unit of polypropylene make this polymer particularly susceptible to oxidative degradation via a free radical mechanism. Primary and secondary hydrogens are less susceptible to oxidation. For comparison the structure of a more oxidatively stable polyolefin, polyethylene, is show. It is more stable because it contains no tertiary hydrogens, only secondary ones. The oxidation mechanism of polypropylene involves initially the chemical reaction of oxygen, O_2, with these tertiary sites to form hydroperoxides along the polymer backbone. The detailed mechanism is complex, but these hydroperoxides then decompose to form free radical species that break chemical bonds by attacking other sites along the polymer chain. There are several paths that lead to chain scission with accompanying formation of carbonyl groups (carbon – oxygen double bonds) [5-7].

The basic mechanism of polypropylene's oxidative degradation is shown below [6]. Here R is used to represent the polypropylene chain. RH represents a tertiary hydrogen atom attached to the rest of the polypropylene molecule.

Scheme 3: Initiation:

$$RH + O_2 \rightarrow ROOH$$

$$RH + O_2 \rightarrow R\cdot + HOO\cdot$$

$$ROOH \rightarrow RO\cdot + HO\cdot$$

$$R\cdot + O_2 \rightarrow ROO\cdot$$

In the first step, the polypropylene chain reacts with molecular oxygen (O_2) to form a hydroperoxide, which can then form various free radical species (highly reactive compounds that contain unpaired electrons indicated by " ·").

Scheme 4: Propagation and Radical Transfer:

$$ROO\cdot + RH \rightarrow ROOH + R\cdot$$

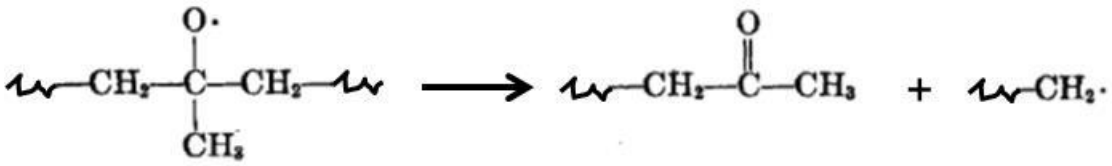
$$RO\cdot + RH \rightarrow ROH + R\cdot$$

$$HO\cdot + RH \rightarrow H_2O + R\cdot$$

In these reactions, the free radical species formed during initiation react with other polypropylene chains, creating new free radical sites on them. These reactions form hydroperoxides (ROOH) and hydroxyls (ROH), which may be detected by methods like Fourier transform infrared spectroscopy (FTIR) and are indicators of polypropylene oxidation.

Disproportionation:

The formed free radical species may terminate by radical coupling or by disproportionation. Disproportionation is believed to be the primary termination mechanism, leading to the formation of aldehydes, ketones, and carboxylic acids, with accompanying chain cleavage [8]. FTIR spectroscopy can be used to detect the presence of these types of functional groups [7]. An example of a typical disproportionation reaction during polypropylene oxidation, leading to the formation of a ketone with accompanying polypropylene chain cleavage (one PP chain is broken into two), is shown below [8]. In this more detailed chemical equation the initial structure on the left-hand-side corresponds to the species RO· Schemes 3 and 4. The reaction shown below is an alternative chemical pathway for the reaction of RO· to those shown in the other two schemes. During oxidative degradation of PP, all of these chemical reactions occur simultaneously.



Scheme 5: Typical Disproportionation Reaction on Polypropylene Leading to Chain Cleavage. Wiggly lines indicate continuation of the rest of the PP chain.

In the presence of UV light, which provides enough energy to break chemical bonds, the oxidative process is accelerated. Chromophores present in polypropylene during fabrication, storage, and processing are believed to play a key role in the initiation of photodegradation [5].

The morphology of polypropylene (crystalline versus amorphous regions) also plays an important role in oxidative degradation. Oxidation occurs preferentially at the surface of the material where there is more oxygen. Oxidation also occurs within the amorphous regions of semi-crystalline polypropylene but not within the crystalline domains where the dense packing of the chains prevent oxygen penetration. Thus the amorphous regions between crystalline domains may be eroded away by oxidation, leading to the formation of micro-cracks in the material with accompanying degradation of mechanical properties [5].

In vivo Degradation of Polypropylene

Living organisms can chemically attack synthetic polymers. Both salts and enzymes present in the body catalyze degradation of polypropylene in biological media. Salts, especially phosphates, catalyze processes leading to the degradation of polymers containing carbonyl groups [9]. Carbonyl groups may exist in the polypropylene due to oxidation prior to implantation, and they are known to be introduced into polypropylene *in vivo* [7] through the action of enzymes. Polypropylene capsules implanted in rats show enzyme activity on their surfaces, involving acid phosphates aminopeptidase, and oxyreductase, after 7 days, with an increase in enzyme activity after 14 days, associated with increased phagocytosis in the region of the implant [9,10]. These processes reflect the natural response of the human body to attack foreign bodies and a scientific basis to understand the *in vivo* effect of the human body's response to a foreign body on polypropylene. Phagocytic cells respond to the injury to degrade debris and foreign materials prior to wound healing. Importantly, for polymer scientists looking at the *in vivo* effects on

polypropylene, it is well-established that the chemistry of phagocytosis involves these cells metabolizing oxygen and producing strong oxidants such as hydrogen peroxide and hypochlorous acid as the product of their foreign body response function [11].

Strong evidence suggests that the process of enzymatic degradation of polypropylene involves a free radical oxidative mechanism, the same as or analogous to those shown above, with oxygen being incorporated into the polymer, first as hydroxyl groups and then as carbonyls [7,9,12]. All evidence is consistent with a degradation mechanism involving oxidative enzymes and oxygen dissolved in the living medium [9]. The body recognizes polypropylene as a foreign substance, which causes an inflammatory response called the "foreign body reaction" [13]. In polypropylene implanted in rats, macrophages and FBGCs were found in both the implants and in the surrounding tissue [14]. Macrophages on the surface of the material fuse to form foreign body giant cells (FBGCs), resulting in secretion of high concentrations of highly reactive oxidizing species (peroxides, acids, enzymes) on the surface of the implant [13]. This foreign body reaction persists at the surface of the implant as long as the implant is in the body [13]. Thus polypropylene, which is known to be susceptible to oxidative degradation, is continually attacked by strong oxidizing agents inside the body.

Effect of Polypropylene Degradation *In Vivo*

Oxidative degradation of polypropylene causes chain scission – it literally breaks the polypropylene molecules apart. This degradation causes a reduction in the mechanical properties (resistance to breaking under load or strength) of the polypropylene since mechanical properties decrease when molecular weight is reduced [7,15]. Furthermore, the degradation starts at the surface of the implant where it is in contact with its surroundings, and the disordered amorphous regions of the polypropylene are particular susceptible.

The polypropylene used in pelvic repair meshes is semicrystalline. Figure 1, shows a schematic of semicrystalline polymer structure, obtained from a basic text in the field of polymer morphology [Ref. 16, Figure 1.2]. The discussion of semicrystalline polymer structure given below is based on this text. The 10 nm scale-bar had been added to provide an approximate idea of the size of these structures.

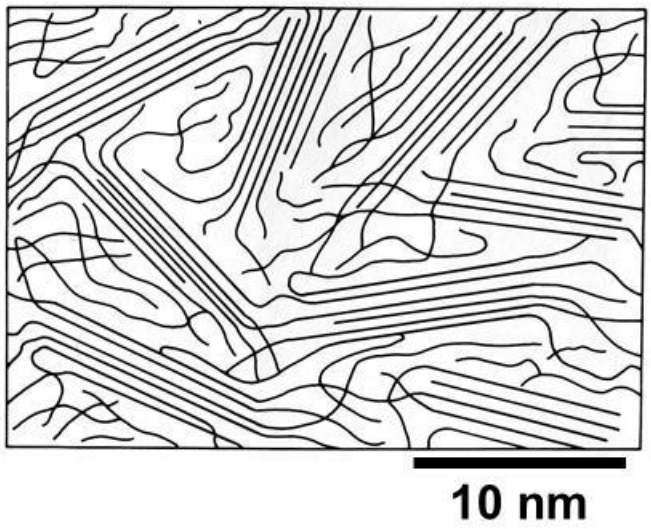


Figure 1: Schematic of Semicrystalline Polymer Morphology

The lines in Figure 1, represent polymer chains. In some parts of the structure the lines are straight and pack parallel to one another. These regions are crystalline; the polymer chains in these crystallites are locked into position relative to one another and resist deformation. In other parts of the structure, the polymer chains take wiggly conformations and are mixed together randomly. These regions are amorphous. The polymer chains in the amorphous regions can be deformed much more easily than those in the crystalline regions. The overall semicrystalline structure is a composite in which individual polymer chains go back and forth between crystallites and amorphous regions, thus tying these regions together. The amorphous regions give the polypropylene fibers the flexibility to bend and be deformed, for instance as they are bent in knitting a mesh structure, and they hold the crystallites together. At the same time, the crystallites regions provide strength, reinforcement and high temperature stability, which is important so the meshes can be sterilized by autoclave. This nanometer-length-scale semicrystalline, composite structure is critical to the properties of the PP fibers. This composite can only deliver the requisite properties as long as it remains intact, i.e. amorphous regions connecting crystallites together.

Figure 1 also suggests that the polymer chains in the amorphous regions are packed less densely than in the crystalline regions. This is true in the actual physical material. In the terminology of the polymer field, the amorphous regions are said to contain more "free volume" than the crystalline regions [17,18]. Free volume is the empty space between the polymer

molecules. The free volume in the amorphous regions allows oxygen and other oxidizing chemical species the space to diffuse into and penetrate the polypropylene structure. Thus, the degradation process erodes the amorphous polymer that bridges the crystallites and results in the formation of cracks in the early stages of implantation, with fragmentation (loss of particulates or peeling) at longer times [19-26]. In selectively removing the amorphous portion of the polypropylene, the part which gives polypropylene fibers their flexibility, the polypropylene becomes stiffer and embrittled [6,11,22,23,27,28].

It should also be noted that oxidation occurs at the surface of the material where it comes into contact with oxygen or oxygen containing substances. Thus, the geometry of the polypropylene implant is important. In articles with higher surface to volume ratios such as films and fibers, the physical properties deteriorate more rapidly upon oxidation [5].

Addition of Anti-oxidants to Polypropylene

As noted above, a number of additives are added to polypropylene in order to modify its properties for the particular application. Anti-oxidants, sometimes called stabilizers, are almost always added to polypropylene due to its high susceptibility to oxidative degradation. Anti-oxidants may be broadly classified as primary, those that work by reacting preferentially with oxygen or the oxidizing species forming stable free radicals, and secondary, those that work by decomposing hydroperoxides involved in the oxidative degradation process [3]. It is common to use a combination of primary and secondary anti-oxidants to stabilize polypropylene.

Prolene resin is Ethicon's proprietary blend of polypropylene that was originally developed for use as a suture material in the 1960's and is still used even today to manufacture all of Ethicon's polypropylene-based mesh products. In a 2003 memo from John Karl of Ethicon to D. Burkley of Ethicon it is stated that "The objective of every polymer resin run has been to duplicate the original formulation as exactly as possible, "warts and all". Hence, virtually no changes have ever been made in the chemistry…" of Prolene, which had a 35 year history of use at the time of the memo [29]. Ethicon's Prolene polypropylene, which is used to manufacture its pelvic mesh, contains Santonox R and dilaurylthiodipropionate (DLTDP). Santonox R is a hindered phenolic antioxidant used to protect Prolene during high-temperature processing (compounding and extrusion), while DLTDP is used to protect Prolene from oxidation during long-term storage. Neither of these anti-

oxidants is designed to protect Prolene from attack by reactive oxygen species generated in the human body in response to implantation of a foreign body.

Addition of anti-oxidants to a polymer cannot permanently prevent its oxidation. This is because the anti-oxidants are consumed as they serve their function of reacting with oxidizing species. Furthermore, the anti-oxidant is dispersed throughout the polymer and only the anti-oxidant at the surface, where the implant is attacked by reactive oxygen species, can protect the polymer until it is eventually exhausted. At this point the foreign body attack continues and the polypropylene resin is degraded with deterioration of its physical properties, stiffening, and cracking. The degradation exposes new surface which is again attacked by reactive oxygen species, and the cycle continues. The foreign body attack persists as long as the implant remains in the body [13].

While it might seem attractive to simply add more anti-oxidant to increase the lifetime of the implant, this is not feasible for two reasons. The additives themselves may prove toxic to the human body and only so much anti-oxidant can be added before the physical properties of the polypropylene are compromised. For example, the Materials Safety Data Sheet (MSDS) for DLTDP [30] states "This material is not intended for use in products for which prolonged contact with mucous membranes or abraded skin, or implantation within the human body is specially intended, unless the finished product has been tested in accordance with the Food and Drug Administration and/or other applicable safety testing requirements." The MSDS sheet for Santonox R [31] states "This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)", and the MSDS cautions regarding skin corrosion/irritation, serious eye damage/eye irritation, skin sensitization, and organ toxicity to the respiratory system [31].

The Choice of Polypropylene as a Material for a Permanent Vaginal Mesh Implant

In 1976 Liebert et al. [6] published a paper entitled "Subcutaneous Implants of Polypropylene Filaments" in the Journal of Biomedical Materials Research. Polypropylene filaments were implanted into hamsters for varying periods of time and upon removal they were characterized using infrared spectroscopy (IR) and dynamic mechanical testing. Their IR analysis showed that oxidative degradation begins to occur after only a few days for polypropylene filaments containing only a trace of phenolic anti-oxidant. Both hydroxyl groups and carbonyl

containing groups were observed by IR. Dynamic mechanical testing implied a loss of suppleness of the filament (increase in modulus), which verified in mechanical terms the oxidation observed by IR spectroscopy. Gel permeation chromatography (GPC) analysis indicated that some chain scission occurs during the first 70 days of implantation. Liebert calculated that under *in vivo* conditions the induction time for oxidation of polypropylene to begin should be far longer (on the order of 20 years) and speculated on reasons for the extremely rapid oxidation *in vivo* [6]. It is now well-known that the foreign body response, discussed above, is responsible for the continual release of strong oxidizing agents at the surface of the implant [13]. In Liebert's study [6] oxidative degradation could be suppressed over the limited time period of the study by adding larger amounts of a hindered phenolic anti-oxidant (primary anti-oxidant) and a sulfur-containing synergist (secondary anti-oxidant).

In 1979 Postlethwait [32] implanted polypropylene sutures in the abdominal wall muscles of rabbits and recovered specimens over intervals from 6 months to 5 years. The polypropylene sutures showed fragmentation in 4% of the sutures examined and the perisutural formation of bone, cartilage or both in 2.6%. This author concludes "Although in most operations these minutiae of tissue reaction concerning polypropylene are of little consequence, it may be necessary to conduct further studies to determine if they have any significance."

In 1986 Jongebloed and Worst [19] used scanning electron microscopy (SEM) to examine a polypropylene surgical suture (supplier not identified) that had been in a human eye for 6.5 years. The suture showed cracks perpendicular to the longitudinal axis of the suture; part of the surface layer was nearly detached or completely missing; while the diameter of the suture was decreased at both ends by over 50% in comparison with the original diameter. The degradation was believed to be caused by the enzymatic actions of tissue fluids. The same group, in a separate paper the same year [20], reported a SEM study on a Prolene (Ethicon) suture that had been implanted in the human eye for one year. The reported that "both Prolene loops showed severe degradation of the surface layer."

In 1998 Mary et al. [21] reported a study that compared the *in vivo* behavior of poly(vinylidene fluoride) and polypropylene (Prolene, Ethicon) sutures used in vascular surgery.

"After 1 and 2 years *in vivo*, the explanted polypropylene sutures showed visible evidence of surface stress cracking.

In 2007 Costello et al. [22,23] studied explanted polypropylene hernia meshes (produced by C.R. Bard and Ethicon) by a variety of techniques and concluded "Cracks and other surface degradations such as peeling of the fibers are indicative of the oxidation of polymeric materials." They also remarked "Polypropylene is highly susceptible to the oxidative effects of the metabolites produced by phagocytic cells during the inflammatory response." And "…polypropylene is susceptible to oxidation, resulting from exposure to strong oxidants such as hydrogen peroxide and hypochlorous acid. These byproducts of the inflammatory response may degrade and embrittle the material, causing it to become rigid." And "Polypropylene is susceptible to oxidation due to its chemical structure" and results in deterioration of its physical properties *in vivo*. Degradation causes surface cracking, mesh contraction, loss of mass, embrittlement, decreased melting temperature, foreign body reactions and reduced compliance of the material. They observed the explanted polypropylene fibers using SEM and noted that "Micrographs of 79% of all explanted specimens exhibited cracks in the transverse or longitudinal direction." Figure 2 shows an SEM image from Costello [Ref. 23, Fig. 5] in which this cracking is evident.

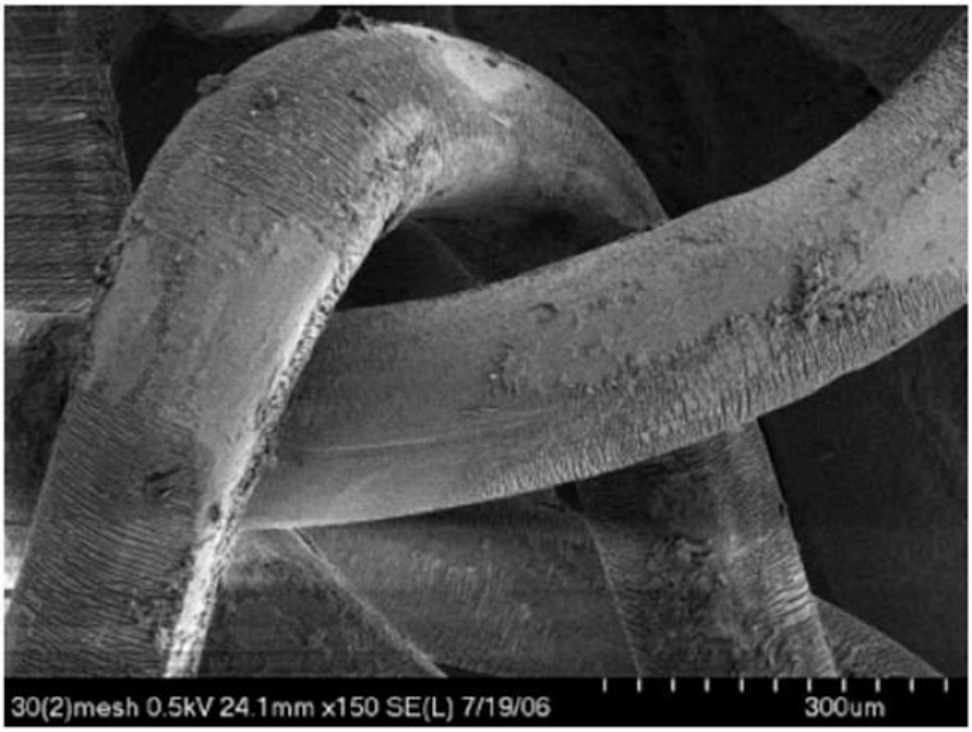


Figure 5. SEM of an explanted polypropylene mesh with transverse cracks.

Figure 2: SEM Image Reproduced From Costello [Ref. 23, Fig. 5] showing transverse cracking indicative of degradation due to oxidation.

At about the same time, Bracco *et al.* [33] also used SEM to observed explanted PP mesh fibers produced by various manufacturers and used in hernia repair and reported transverse cracking as characteristic of the damage they observed. Figure 3 is an SEM image of this cracking in PP fiber reproduced from Bracco [Ref. 33, Fig. 3]. Bracco [33] postulated that the primary cause of the cracked and degraded morphology of the PP fibers was absorption of small organic molecules of biological origin including cholesterol, squalene, and esterified fatty acids.

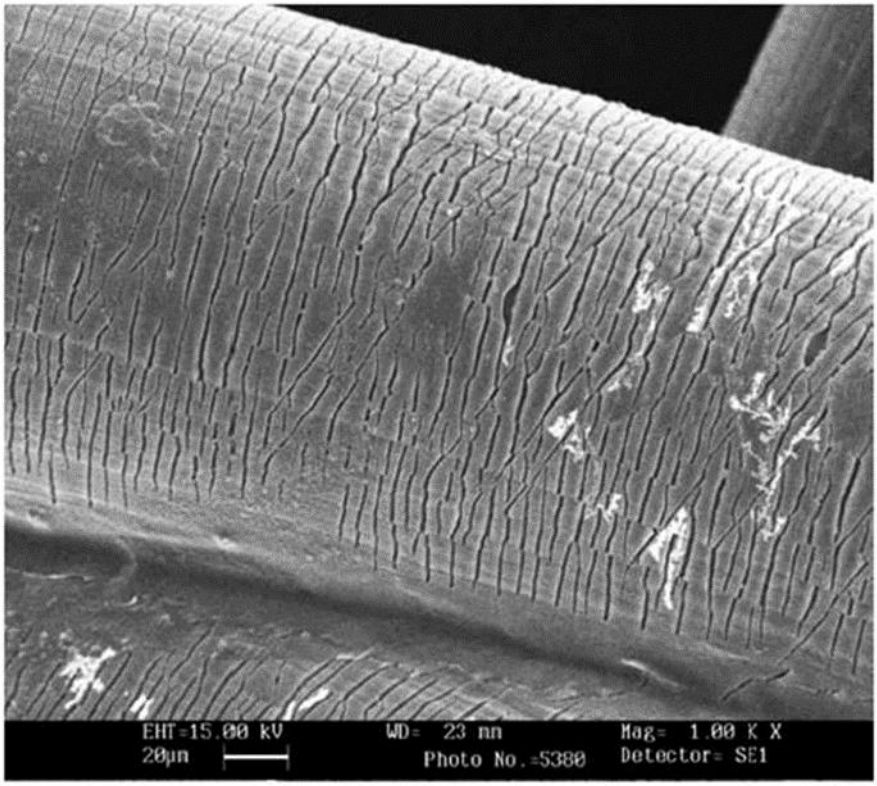


Fig. 3 Scanning electron microscopy (SEM) micrograph (1,000×) of fragment #9 polypropylene (PP)

Figure 3: SEM image of explanted PP fiber from Bracco [33]

Clave *et al.* in 2010 published a paper entitled "Polypropylene as a reinforcement in pelvic surgery is not inert: comparative analysis of 100 explants" [24]. They reported polypropylene pelvic mesh damage including "superficial degradation, which appeared as a peeling of the fiber surface, transverse cracks in the implant threads, significant cracks with disintegrated surfaces and partially detached material, and superficial or deep flaking." Figure 4 shows three SEM images from Clave [Ref. 24, part of Fig. 1] showing the transverse cracking they reported as characteristic of degradation of explanted PP fibers due to oxidation.

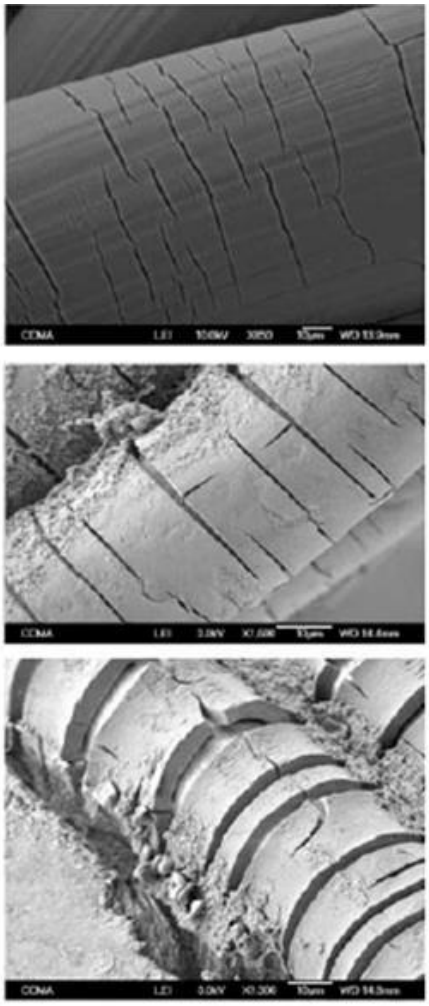


Figure 4: SEM of Transverse Cracking in Explanted PP Fibers from Clave [Ref. 24, part of Fig. 1]

Lefranc et al. [34] concluded that PP fiber meshes degrade when implanted for pelvic wall support, and cited transverse cracking as observed by SEM on explants as a characteristic identifier of this degradation. Lefranc [Ref. 34, Fig. 25.9] published a dramatic image of this cracking in explanted PP fibers, which he attributes to Clave, but which was not published in Clave's study [24]. This image taken by Clave, but published by Lefranc, is shown in Figure 5.

Fig. 25.9 SEM observation of degraded PP mesh under septic environment

Figure 5: SEM image of explanted PP mesh fibers with transverse cracking indicative of degradation [34].

As noted above, based on experiments in which degraded explanted PP fibers were extracted with hexane, Bracco [33] postulated that the primary cause of the cracked and degraded morphology of the PP fibers was their absorption of small organic molecules of biological origin including cholesterol, squalene, and esterified fatty acids. Subsequent researchers (Clave [24]; Lefranc [34]) have mentioned Bracco's small organic molecule hypothesis but have attributed degradation of the explanted PP fibers primarily to oxidation. Costello et al. [22,23] also attributed degradation observed in explanted polypropylene hernia meshes to oxidative degradation.

It is my opinion that Bracco has shown that some small, biologically derived organic molecules can be absorbed into the outer layers of implanted PP fibers. His study has not shown, however, that this process is the direct cause of fiber degradation, although it very well could be a contributing factor that aids oxidation. In the last paragraph of the *Discussion* section of their paper Bracco et al. try to explain their idea as to how absorption of small organic molecules could contribute to fiber degradation. The phenomenon that they are trying to explain is well known to

polymer scientists and is referred to as plasticization [35,36]. Plasticizers are small organic molecules that are absorbed into a solid polymer and soften it. The mechanism of this softening involves increasing the free volume space in amorphous regions of a solid polymer structure. The amorphous regions of the PP semicrystalline structure, as shown in Figure 1, are susceptible to plasticization by absorption of the types of biological, small organic molecules that Bracco observed. In particular esterified fatty acids are well known to plasticize polymers [37-39]. It is likely that an increase in free volume of the amorphous regions of implanted PP fibers due to plasticization from the absorption of small, biological organic molecules facilitates increased penetration into the PP fibers by oxygen and other oxidizing chemical species, thus accelerating PP fiber degradation due to oxidation.

Very recently Imel et al. [25] reported a study of *in vivo* degradation of polypropylene pelvic mesh (Boston Scientific) using methods specifically chosen to test whether or not oxidative degradation is responsible for observed changes in the mesh upon implantation. Both Fourier-Transform Infrared (FT-IR) spectroscopy and energy dispersive X-ray (EDS) spectroscopy showed clear signs of oxidative degradation. The EDS experiments were carried out within a scanning electron microscope (SEM) and were used to look for the presence of oxygen in polypropylene fibers (pristine polypropylene only contains carbon and hydrogen). EDS was also used to distinguish clean polypropylene fibers from biological tissues or fibers coated with biomaterial (biological material contains both oxygen and nitrogen, both of which can be detected in EDS). Thus the presence or absence of nitrogen in EDS was used as a discriminator of clean versus tissue contaminated fiber.

All explanted samples (implantation periods for the 11 samples ranged from 16-57 months) showed the presence of oxidation by both FT-IR and SEM/EDS [25]. The oxidative degradation was accompanied by cracking transverse to the fiber axis [25] as observed previously by other workers using SEM to examine explanted polypropylene hernia and pelvic mesh [20-24,33,34].

As discussed above, the oxidative degradation of polypropylene is known to cleave polymer chains, thereby reducing their molecular weight. Adequate amounts of 4 of the explanted samples were available to allow Imel et al. to characterize their molecular weights by gel

permeation chromatography (GPC). GPC showed significant reductions in weight-average and z-average molecular weights and a narrowing of the molecular weight distributions as compared to the same non-implanted material [25]. These changes in the molecular weight characteristic of the polypropylene are fully consistent with oxidative degradation and cannot be explained by absorption of small biological molecules [25]. Iakovlev et al. [26] recently carried out microscopic analysis of various explanted polypropylene meshes (from several suppliers including Ethicon), observed a degradation layer or "bark" and have proposed oxidative degradation as a mechanism consistent with their results.

Based upon all the published scientific studies discussed in this section, the step-by-step degradation process of polypropylene pelvic meshes *in vivo* may be summarized as follows: The implant causes increased activity by oxidative enzymes (foreign body response) in the vicinity of the implant. This leads to an oxidative degradation process that is evidenced by the appearance of hydroxyl and then carbonyl groups in the polypropylene, as observed by infrared spectra. There is accompanying degradation of the polypropylene molecular weight, and this process may be delayed, but not prevented, by the presence of anti-oxidants in the polypropylene. Anti-oxidants are preferentially consumed by the oxidizing species and over a period of months [25] their concentration falls below a level required to protect the polymer and oxidative degradation occurs [3]. This degradation is accompanied by a decrease in mechanical properties (embrittlement, loss of mass, decreased melting temperature, reduced compliance) of the polypropylene [3,23]. In particular, the surface and amorphous regions of the polypropylene are selectively degraded, resulting in cracks and, on longer exposure, fragmentation of the implant [22,25].

The change in materials properties of a material implanted in the female pelvis poses unreasonable risk of harm and is defective from a design perspective in terms of the material choice made by Ethicon. A polymer that cannot maintain its physical properties in its intended application is not a suitable choice for a reasonable engineer faced with polymer choices for the intended use as a permanently implanted mesh in the pelvis, as use of polypropylene may pose an unreasonable risk of harm to a patient. This is as a direct result of the degradation of the polypropylene fibers and its effect on the performance of the mesh due to embrittlement, stiffening, and tissue reaction cascade which may each affect the polypropylene and the tissues surrounding it *in vivo*.

In 2011 Ostergard [40] published an article entitled: "Degradation, infection and heat effects on polypropylene mesh for pelvic implantation: what was known and when it was known" The paper begins with the following two sentences: "Many properties of polypropylene mesh that are causative in producing the complications that our patients are experiencing were published in the literature prior to the marketing of most currently used mesh configurations and mesh kits. These factors were not sufficiently taken into account prior to the sale of these products for use in patients." The following are relevant facts, when they were known, and where they were published, obtained from Ostergard [40].

- "1953 Any implanted device must not be physically modified by tissue fluids, be chemically inert. [40 referencing 41].
- "1986 Degradation of PP suture known as seen with SEM." [40 referencing 19]
- "1998 PP mesh shrinks 30-50% after 4 weeks". [40 referencing 42]
- "2001 The abdominal wall stiffens after mesh insertion." [40 referencing 43]
- "2010 Degradation occurs in all currently used meshes." [40 referencing 24]

Thus as early as 1953 it was recognized that an implanted material must not be modified by body fluids and must be chemically inert. This commonsense directive and the susceptibility of PP to chemical transformation via oxidation both *in vivo* and *in vitro*, which—as documented above—was known at the time the Ethicon pelvic mesh products were designed and manufactured.

The literature clearly shows that the properties of polypropylene mesh change after implantation, causing adverse events like pain, scarring, and inflammation [40]. These injuries are directly caused by the change of the intended chemical and performance make-up of polypropylene mesh. Stiffening or reduced compliance of the polypropylene pelvic mesh upon degradation has important implications on the intended performance of the mesh as a biomaterial. The stiffness of a biomaterial implant must be compatible with the tissues with which it comes into permanent contact – this is fundamental to biocompatibility [44]. The mesh is designed to be soft and flexible and move with the soft pelvic tissue. However, as the polypropylene mesh undergoes oxidative degradation it becomes stiffer, much stiffer than the pelvic tissue. When a force is applied to this mesh/tissue interface the softer tissue moves but the mesh does not. This creates a shear force on

the tissue [45] akin to running a polypropylene fiber (monofilament fishing line) back and forth over skin. Consequently, based on the available scientific literature, the effect of relative movement between the polypropylene pelvic mesh that has undergone chemical changes, degradation, and reduced compliance and the surrounding tissue is a destructive effect to tissue, leading to pain, inflammation, and possible erosions.

Before launching its SUI and POP mesh products, Ethicon scientists concluded that the Prolene polypropylene degrades *in vivo*

Ethicon has reported evidence of PP oxidation and degradation since the 1980s. These internal documents report evidence of degradation of Prolene sutures, as well as instances of chronic inflammation and oxidation. In 1981, the depth of surface cracks (0.5-4.5 microns) was measured for explanted Prolene sutures [46]. Another document from 1983 reported cracking of explanted Prolene sutures [47], with one of the explanted sutures retaining only 54% of its original strength, and noting that the histological evaluation of explanted sutures was consistent with previous studies, characterized by a foreign body reaction and a "degraded acellular infiltrate." In this work Ethicon scientists used the same staining method employed by Iakovlev et al. [26] to stain the degraded polypropylene and confirm that the cracked layer was Prolene polypropylene and not biological material. This document also refers to a "Prolene Microcrack Committee". Thus, Ethicon was sufficiently aware of Prolene surface cracking and concerned enough about the consequences to form a committee to investigate the mechanism of cracking.

Two Ethicon memos from 1984 involved microcracking of explanted PP sutures from both ophthalmic and cardiovascular applications [48]. Sutures that were in the body for more than two years exhibited surface or severe transverse cracks ranging from 2 – 5 microns thick. Dr. Peter Moy of Ethicon wrote in another 1984 report that "oxidative degradation is another mechanism through which transverse cracks may be produced on oriented fibers" [49]. To try and reproduce the observed cracking *in vitro*, Prolene sutures were incubated in aqueous 30% hydrogen peroxide for up to a year. While transverse cracks were not observed, IR spectroscopy revealed the presence of oxidation products, which led Dr. Moy to conclude that "the possibility of a highly specific *in vivo* oxidation process remains." His conclusion is correct - the foreign body reaction actually produces a stronger oxidizing environment than 30% hydrogen peroxide alone [50], thus cracking may occur within the body while no cracking is observed in the

presence of peroxide. Dr. Moy also cited thermal stability and electron microdiffraction data to support his hypothesis that at least a portion of the cracked layer contained protein. He recommended an additional study to test this hypothesis by performing TEM analysis of known oxidized Prolene samples. A memo dated November 13, 1984 by Mr. Dan Burkley of Ethicon, reported that Prolene microcracks were evaluated using Attenuated Total Reflectance (ATR) and FTIR. These investigations revealed that the cracked Prolene surface was a composite of oxidized polypropylene and absorbed protein [51].

In 1985, a series of experiments, including FTIR, TEM, and histology, were performed to determine the clinical functionality of cracked sutures, the cracking mechanism, and effects of anti-oxidant concentration [52]. Dr. Moy noted that laboratory experiments had not replicated the cracking observed in explants, and proposed a systematic evaluation of explanted Prolene sutures.

In 1987, Ethicon was provided with explanted sutures, which had been cleaned using bleach solution as explained in Mr. Burkley's laboratory notebook [53]. SEM images of sutures implanted for 8 years revealed severe cracking. Scrapings were taken from explanted sutures and tested using calorimetry and FTIR. The waxy scrapings showed a melting point of 147 – 156 ^{o}C, and noted "This is the melting range previously observed for oxidatively degraded polypropylene." Non-degraded Prolene melts over the range 155 – 165 ^{o}C. Scrapings were also melted onto a KBr window in order to obtain FTIR spectra, which showed peaks of β-keto esters, which are known to be formed during polypropylene oxidation. Mr. Burkley noted that "no protein species or peptide bonds were suggested." A memo reporting on a follow-up meeting confirmed the findings that no protein was found on the surface and that Prolene degradation occurred on the surface of the fibers [54]. Several follow-up studies were proposed, including investigating the relationship between anti-oxidant concentration and polypropylene degradation and cracking. It is not clear whether or not these studies were ever performed.

In 1992 an Ethicon memo on 7 Year Data for 10 Year Prolene Study by Lindemann, Muse, and Burkley [55] reported "IR spectra obtained for cracked Prolene specimens (Figure A) showed possible evidence of slight oxidation…" and noted that "degradation in Prolene is still increasing".

Ethicon was also informed of the risks inherent to using polypropylene in an implantable medical device through the Material Safety Data Sheet (MSDS), which states that polypropylene is incompatible with strong oxidizers [56]. As explained above, implanted mesh is exposed to reactive oxygen species, which are strong oxidizers, as a result of the foreign body reaction. The report from Ethicon's Mesh Repair of Uterovaginal Prolapse meeting in May 1997 noted that an ideal mesh would have a lower density, in order to minimize the foreign body reaction [57]. Similar concerns were noted in a document on the design of new mesh for prolapse repair, in which it was noted that Prolene polypropylene mesh is not the ideal material for anterior prolapse, and that the amount of foreign body reaction should be minimized to reduce the risk of complications [58].

Despite internal and published studies, noted above, to the contrary, Ethicon documents further indicate that their sales force was instructed to "[r]eassure [surgeons] that PROLENE is proven to be inert and there are hundreds of papers going back 25 years to reinforce this point" [59]. However, Mr. Dan Burkley, a Principal Scientist at Ethicon, testified that in his 34 years at the company, he was only familiar with one study that was conducted regarding the changes that occurred due to oxidative degradation of explanted polypropylene suture or mesh [60]. Mr. Burkley also testified that this study showed that changes due to oxidation were still progressing after seven years of implantation [61]. Finally, Dr. Thomas Barbolt, a former Ethicon scientist, testified that the Prolene polypropylene used by Ethicon in manufacturing its SUI and POP meshes undergoes surface degradation while implanted in the human body and that Ethicon knew this several years before claiming in its IFU that the material is not "subject to degradation" [62].

Summary

In summary, polypropylene is susceptible to oxidative degradation and this degradation takes place *in vivo*, resulting in degradation of polypropylene meshes, including Ethicon's Prolene-based polypropylene meshes, which are used as permanent implants in pelvic surgery. There is a linear causative chain established by the scientific literature from polypropylene's chemical characteristics, its degradation, degradation's effect on the polypropylene rendered into

a mesh, and the effects to the human body. The process of oxidative degradation of polypropylene is tested and established chemistry. Thus, the more than half-century old rationale of adding anti-oxidants to polypropylene. Likewise, the process of oxidative degradation in vivo of polypropylene is tested, studied, and published. This established science includes studies specifically of Prolene polypropylene. The scientific evidence establishes that upon implantation the polypropylene implant is detected as a foreign material within the body causing the foreign body response. This leads to the release of strong reactive oxygen species and oxidative enzymes in the vicinity of the implant. This in turn leads to an oxidative degradation process, which may be delayed but not prevented by addition of anti-oxidants, which is detected by the appearance of hydroxyl and then carbonyl groups in the polypropylene, as evidenced by infrared spectra. There is accompanying degradation of the polypropylene molecular weight. This degradation, which will continue as long as the implant is in the body, is accompanied by a decrease in the mechanical properties of the implant. In particular, the surface and amorphous regions of the polypropylene are selectively degraded, resulting initially in cracks, flaking, and on longer exposure fragmentation of the implant. The polypropylene implant also stiffens in response to oxidative degradation. This creates a mechanical mismatch with the surrounding tissue that can lead to pain, inflammation, and tissue damage in patients implanted with the device.

From a materials science and polymer engineering perspective, Ethicon's Prolene polypropylene, as utilized in all Ethicon pelvic mesh products to treat SUI or POP, foreseeably cannot perform as intended, where intended, for as long as intended, posing a substantial risk for the person for whom it is intended, and is thus unreasonably dangerous to sell for the uses Ethicon sold it for. Ethicon was unreasonable, based on the scientific and engineering knowledge available, to sell these devices for the intended applications.

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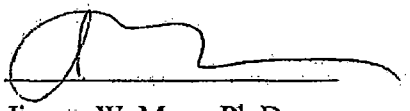

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- Invited Speaker at Gordon Research Conference on Polymers, Ventura, CA, 1999.
- Lead Academic Speaker at the U.S. Army – sponsored Workshop on Flexible Barrier Materials for the Soldier System, Natick Research and Engineering Development Center, Natick, MA, 1999.
- Co-Organizer (with N. Hadjichristidis and S. Gido) of the symposium, “Block Copolymers: Designing Molecules for Applications”, for the National American Chemical Society Meeting in New Orleans, August 1999.
- Invited Speaker at Gordon Research Conference on Elastomers, July 2001
- Organizing Committee, Waters/International Symposium on Polymer Analysis and Characterization GPC Symposium, Baltimore, MD, June 7-12, 2003.
- Organizing Committee, Session Chair, International Symposium on Ionic Polymerization, Boston, MA, June 30 – July 4, 2003.
- Chaired session on Controlled Architecture Polymers, National Meeting of the American Physical Society, Austin, TX, April 3 – 7, 2003.
- Vice-Chair of Polymers West Gordon Conference, 2005.
- Elsevier Editors Conference, Sonoma, CA, April 25 – 26, 2003.
- TANDEC Faculty Affiliate (2002-2008).
- Plenary Speaker at DOD MAP-MURI Workshop, Aberdeen, MD, May 27-28, 2003.

- Work on polymerization in ionic liquids featured in Chemical and Engineering News, May 3, 2004, pp. 26 – 29.
- Artwork from feature article on techniques in anionic polymerization selected for the cover of the December 15, 2005 issue of Journal of Polymer Science, Polymer Chemistry Edition.
- Invited Speaker, Polymers West Gordon Research Conference, January 2005.
- Invited Speaker, Ion Containing Polymers Gordon Research Conference, May 2005.
- Member of University of Tennessee Textiles and Nonwovens Development Center (TANDEC) Management Board (2004-2008).
- Co-Organizer of International Symposium on "Precise Characterization of Complex Polymers and Their Hierarchical Structures" at the International Chemical Congress of Pacific Basin Societies, "Pacifichem 2005", Honolulu, HI, December 15 – 20, 2005.
- International Advisory Board Member for International Symposium on Ionic Polymerization (2005 – present).
- Organizer of 19th International Symposium on Polymer Analysis and Characterization (ISPAC) in Oak Ridge, Tennessee, June 12 – 14, 2006.
- Chair Polymers West Gordon Research Conference, 2007.
- Founding Chair, Polymers West Graduate Research Seminar, 2007.
- Co-Organizer (with J. Pickel and J. Messman), American Chemical Society 2007 Graduate Polymer Research Conference, Knoxville, TN, June 3-6, 2007.
- Invited Participant in National Science Foundation Workshop on Interdisciplinary, Globally Leading Polymer Science and Engineering (co-sponsored by AFOSR, ARO, NASA, NIH/NIBIB, and NIST), August 15 – 16, 2007.
- Co-Organizer, Symposium on "Polymer Surfaces and Interfaces: Loops, Branches, and Brushes", 235th National Meeting of the American Chemical Society, New Orleans, LA, April 6 – 8, 2008.
- International Advisory Committee, 5th East-Asian Polymer Conference, June 2008.
- Theme Leader, Center for Nanophase Materials Sciences theme on Functional Polymer Architectures (2007 - 2011).
- NSF Review Panel Member for CAREER Awards in Polymer Science, October 13 – 14, 2008.
- Reviewer of Science Alliance JDRD proposals (2008 - 2012).
- Polymer IRC Advisory Board Member (UK polymer consortium; 2009 - 2011).
- 2009 – Beta test site Tosoh Bioscience Eco-SEC size exclusion chromatography system.
- Member International Advisory Committee for Helenic Polymer Symposium (2010).
- 2010 – reviewer for DOE Young Investigator proposals (5) in polymer area.
- 2010 to date – member Department of Chemistry Advisory Committee.
- Discussion Leader, Macromolecular Materials Gordon Research Conference, January 9 – 14, 2011.
- 2011 – reviewer for DOE Young Investigator proposals (5) in polymer area.
- 2011 – NSF panel reviewing proposals on nanomanufacturing (April 4-5, 2011).
- September 2011, formed BBB Elastomers LLC to commercialize new thermoplastic elastomer technology.
- July 2011 – participant in ORNL-sponsored Soft Matter Retreat.
- UTK Provost's Science Advisory Committee (2007 2014).

- Reviewer of Greek research proposals (2010-2012).
- 2011 - Lecturer in Workshop on ARO Funding, sponsored by UTK Office of Research.
- Hosted undergraduate student in summer REU program (2011-14).
- Summer 2011 – search committee for VP of UTRF.
- 2011- date – Chemistry Department Instrumentation Committee.
- Presentations on polymers to summer REU students (2011, 2012).
- 2012 – date - Member VolsTeach Leadership Counsel.
- 2012 – reviewer of Portugese funding agency research proposal.
- 2012 – reviewer of Mechanistic Organic Chemistry, W. W. Norton & Co.
- 2012 – Ph.D. committee of Greek graduate student Konstantinos Misichronis.
- 2012 – Selection Committee Member, 2013 ACS PMSE Fellows.
- Keynote Speaker, NIST Workshop on Macromolecular Separations-By-Design, Gaithersburg, MD, October 10 – 11, 2012.
- 2012 – 13 - reviewer of *Organic Chemistry*, new text by Joel Karty.
- 2013, 2014 – Reviewer of DOE-BES Young Investigator Proposals in Materials Chemistry.
- 2013 – Chair, Peer Review of Teaching Committee reviewing Professor Mike Kilbey.
- 2013 – Organizer of Herman Mark Scholar Award Symposium in Honor of Rigoberto Advincula at the ACS National Meeting in Indianapolis, IN, September 2013.
- 2013-16 – Member of Selection Committee for the ACS Award in Applied Polymer Science.
- Member Ziegler Professor Selection Committee (2002 – present).
- Chair – UT Chemistry Department Instrumentation Needs Commmittee – 2013 to date.
- 2014 - CNMS search committee for two polymer science hires.
- 2014 – present - member of ORNL Soft Matter Council.
- Advisor to Chemistry Undergraduates (about 12 at any time) 2005 - date.
- 2013 - Reviewer Promotion Package, Apostolos Avgeropoulos (Ioaninna).
- 2014 - Reviewer Promotion Package, Lian Hutchings (Durham).
- 2013, 2014, 2015 – Nominator of Mark Dadmun as ACS Fellow.
- 2014 – Member of ACS Polymer Chemistry Division Committee charged with enhancing award support for division awards.
- Work on electric field induced selective disordering of block copolymers was selected by the European Synchrotron Radiation Facility (ESRF) for a highlight as some of the most exciting work carried out at the facility over the year 2013.
- 2014 – Invited Reviewer for R&D program of Wrigley Inc.
- 2014 – Reviewer for promotion packages of Eugenia Kharlempieva (UAB), Marinos Pitsikalis (Athens), Georgios Sakellariou (Athens), and Hermis Iatrou (Athens).
- 2014 – Nominated Tom Zawodzinski for Fellow of ACs Polymer Chemistry Division.
- 2015 – Reviewer of DOE Early Career Proposals.
- 2015 – Chair of Strategic Hiring Plan Committee, UT Department of Chemistry.
- 2014-2015 – Organizer of symposium on anionic polymerization for ACS Spring 2016 National Meeting.
- 2014-2015 – Member of Organizing Committee for International Symposium on Polymer Analysis and Characterization in Houston, June 2015.

- 2014-15 – Member of Organizing Committee for Pacifichem Symposium on Solution Properties of Polymers and their Supramolecular Assemblies, December 2015.
- 2014-15 – Chair, Organizing Committee for GPC2015 Polymer and Polyolefin Characterization Conference, September 2015.
- 2015 - External Reviewer for Ph.D. Dissertation of Bishnu Prasad Koiry, Indian Institute of Technology, Kharagpur.
- 2015 – Chair, Award Committee for ACS Award in Applied Polymer Science.
- 2015 – Reviewer of *Organic Chemistry, Principles and Mechanisms*, 1st Edn. by Joel Karty, providing feedback for preparation of a new 2nd edn.
- 2015 - Interviewed by UTK business students in course on Entrepreneurship.
- Presentation to SAACS on Careers in Polymer Chemistry, October, 2015.
- Performed peer review of teaching for promotion package of Prof. Michael Best.
- Participant in various other national and international conferences and workshops on polymers.

RECENT HONORS AND AWARDS

- 2001 Caroline P. and Charles W. Ireland Prize for Scholarly Distinction (UAB's highest award to faculty in arts and sciences).
- 2001 University Scholar UAB (honorary faculty status granting maximum latitude in conducting interdisciplinary teaching and research).
- 2003 Arthur K. Doolittle Award, Polymeric Materials Science and Engineering Division, American Chemical Society.
- 2006 Guest Professor, East China University of Science and Technology, Shanghai, China.
- 2007 Chair, Polymers West Gordon Research Conference.
- 2007 Founding Chair, Polymers West Graduate Research Seminar.
- 2008 Highlands in Chemistry Lecturer, Virginia Tech.
- 2008 Distinguished Service Award, ACS Division of Polymer Chemistry.
- 2009 Bayer Lectures on Polymer Chemistry, Cornell University.
- 2009 Southern Chemist Award of ACS.
- 2010 Founding Fellow, ACS Division of Polymer Chemistry.
- 2010 Gold Medal of the Greek Polymer Society.
- 2010 Technology 2020 Inaugural Pathfinder Research Entrepreneur of the Year.
- 2011 Jump Litigation Award from CIBA Vision (in recognition of outstanding contributions in protection of their silicone hydrogel innovations).
- 2011 Herman Mark Senior Scholar Award, ACS Division of Polymer Chemistry.
- 2011 Outstanding Alumni Award, University of Akron.
- 2011 Fellow, American Chemical Society.
- 2012 Certificate of Appreciation, ACS Journals, in recognition of contributions as a referee to numerous ACS Journals.
- 2012 Fellow, ACS Division of Polymeric Materials Science and Engineering.
- 2012 Fellow, American Association for the Advancement of Science.
- 2012 Guest Professor, Northwestern Polytechnical University, Xi'an, China.
- 2013 Bill & Melinda Gates Foundation Grand Challenges Explorations Award.

- 2014 Fellow, Royal Society of Chemistry.
- 2014 Guest Professor, Soochow University, Suzhou, China.

PEER-REVIEWED PUBLICATIONS AND BOOKS: (h index 53; >10,000 citations)

1. "Properties and Chain Flexibility of Poly(tetrahydropyranyl-2-methacrylate)," N. Hadjichristidis, J.W. Mays, R.D. Vargo, and L.J. Fetters, J. Polymer Science, Polymer Physics Ed., 21, 189-195 (1983).

2. "Properties and Chain Flexibility of Poly(dl-isobornylmethacrylate)," N. Hadjichristidis, J.W. Mays, W. Ferry, and L.J. Fetters, J. Polymer Science, Polymer Physics Ed., 22, 1745-1751 (1984).

3. "Characteristic Ratios of Model Polydienes and Polyolefins," J.W. Mays, N. Hadjichristidis, and L.J. Fetters, Macromolecules, 17, 2723-2728 (1984).

4. "Molecular Characterization of Poly(2-methyl-1,3-pentadiene) and Its Hydrogenated Derivative, Atactic Polypropylene," Z. Xu, J.W. Mays, X. Chen, N. Hadjichristidis, F.C. Schilling, H.E. Bair, D.S. Pearson, and L.J. Fetters, Macromolecules, 18, 2560-2566 (1985).

5. "The Unperturbed Dimensions of Poly(2-chloroethylmethacrylate)," J.W. Mays, W. Ferry, N. Hadjichristidis, and L. J. Fetters, Macromolecules, 18, 2330-2331 (1985).

6. "Effects of Solvent and Temperature on the Unperturbed Dimensions of Polystyrene," J.W. Mays, N. Hadjichristidis, and L.J. Fetters, Macromolecules, 18, 2231-2236 (1985).

7. "Solution Properties and Chain Flexibility of Poly(p-tert-butylstyrene)," J.W. Mays, W.M. Ferry, N. Hadjichristidis, and L.J. Fetters, Polymer, 27, 129-132 (1986).

8. "Temperature Dependence of Unperturbed Dimensions for Stereoirregular 1,4-Polybutadiene and Poly(α-methystyrene)," J.W. Mays, N. Hadjichristidis, W.W. Graessley, and L.J. Fetters, J. Polymer Science, Polymer Physics Ed., 24, 2553-2564 (1986).

9. "Molecular Weights of Polyolefins by Vapor Pressure Osmometry at Elevated Temperatures," J.W. Mays and E.G. Gregory, J. Applied Polymer Science, 34, 2619-2622 (1987).

10. "Rheological Properties of Poly(1,3-Dimethyl-1- butenylene) and Model Atactic Polypropylene," L.B. Younghouse, L.J. Fetters, D.S. Pearson, and J.W. Mays, Macromolecules, 21, 478-484 (1988).

11. "Star-Branched Polystyrenes: An Evaluation of Solvent and Temperature Influences on

Unperturbed Chain Dimensions," J.W. Mays, N. Hadjichristidis, and L.J. Fetters, Polymer, 29, 680-685 (1988).

12. "Characteristic Ratios of Polymethacrylates," J.W. Mays and N. Hadjichristidis, Journal of Macromolecular Science - Reviews in Macromolecular Chemistry and Physics, C28 (3&4), 371-401 (1988).

13. "Solution Properties and Chain Stiffness of Cyanoethylhydroxypropylcellulose," J.W. Mays, Macromolecules, 21, 3179-3183 (1988).

14. "Properties of Poly (α-methylstyrene) in Toluene: A Comparison of Experimental Results with Predictions of Renormalization Group Theory," J.S. Lindner, W.W. Wilson, and J.W. Mays, Macromolecules, 21, 3304-3312 (1988).

15. "Temperature Coefficients of Unperturbed Dimensions for Atactic Polypropylene and Alternating Poly(ethylene - propylene)," J.W. Mays and L.J. Fetters, Macromolecules, 22, 921-926 (1989).

16. "The Influence of Star-Core-Exclusion on Polymer-Polymer Miscibility," A.B. Faust, P.S. Sremcich, J.W. Gilmer, and J.W. Mays, Macromolecules, 22, 1250-1254 (1989).

17. "The Influence of Star Polymer Functionality on the Core Exclusion Exhibited in Melt Blends," P.S. Sremcich, A.B. Faust, J.W. Gilmer, and J.W. Mays, Polymer Comm., 30, 146-149 (1989).

18. "Viscosity/Temperature Relationships for Linear and 12-arm Star Polystyrenes in Dilute Solution," M. Liouni, C. Touloupis, N. Hadjichristidis, and J.W. Mays, J. Appl. Polym. Sci., 37, 2699-2708 (1989).

19. "Synthesis and Solution Properties of Polymethacrylates with Alicyclic Sidegroups," K. Kioulafa, J.W. Mays and N. Hadjichristidis, Macromolecules, 22, 2059-2062 (1989).

20. "Application of Extrapolation Procedures to Viscosity Data Below the Theta Temperature," J.W. Mays, N. Hadjichristidis and J.S. Lindner, Polymer Comm., 30, 174-176 (1989).

21. "Synthesis of High Molecular Weight Near-Monodisperse Poly(4- methylstyrene) by Anionic Polymerization," J.W. Mays and N. Hadjichristidis, Polymer Bulletin, 22, 471-474 (1989).

22. "Viscosity - Temperature Relationships for Dilute Solutions of Linear and Star Polyisoprenes," M. Liouni, C. Touloupis, N. Hadjichristidis, and J.W. Mays, Eur. Polym. J., 26, 479-483 (1990).

23. “Synthesis and Unperturbed Dimensions of Poly(diphenylmethyl Methacrylate)”, J. W.

Mays, N. Hadjichristidis, and J. S. Lindner, J. Polym. Sci. Part B: Polym. Phys., 28, 1881 – 1889 (1990).

24. “Synthesis of Model Branched Polyelectrolytes," J.W. Mays, Polym. Comm., 31, 170-172 (1990).

25. "Glass Transition Temperatures of Polymethacrylates with Alicyclic Side Groups," J.W. Mays, E. Siakali-Kioulafa, and N. Hadjichristidis, Macromolecules, 23, 3530-3531 (1990).

26. "Synthesis of Simple Graft Polyisoprene-graft-Polystyrene by Anionic Polymerization," J.W. Mays, Polymer Bulletin, 23, 247-250 (1990).

27. "Solution Properties and Characteristic Ratio of Near-Monodisperse Poly(tert-Butylmethacrylate)," A. Karandinos, J.W. Mays, and N. Hadjichristidis, Polymer Bulletin, 24, 251-254 (1990).

28. "The Chain Flexibility and Structure Relationships of Polymers, Part 1," Z. Xu, J.W. Mays, and N. Hadjichristidis, Journal of Functional Polymer (China), 3, 1-12 (1990).

29. "The Chain Flexibility and Structure Relationships of Polymers, Part 2," Z. Xu, J.W. Mays, and N. Hadjichristidis, Journal of Functional Polymer (China), 3, 81-96 (1990).

30. "Measurement of Polymer Molecular Weights by Osmometry," J.W. Mays and N. Hadjichristidis, in Modern Methods of Polymer Characterization, H.G. Barth and J.W. Mays, Eds., Wiley-Interscience, pp. 201–26 (1991).

31. “Dilute Solution Properties and Temperature Dependence of Unperturbed Chain Dimensions for Poly(p-tert- butylstyrene),” J.W. Mays, S. Nan, and D. Whitfield, Macromolecules, 24, 315-318 (1991).

32. “Hydrodynamic Properties of Polystyrene in Dilute n-Butyl Chloride Solution,” M.E. Lewis, S. Nan, and J.W. Mays, Macromolecules, 24, 197-200 (1991).

33. “Solution Properties and Unperturbed Dimensions of Stereoirregular Poly(t-butyl methacrylates),” A. Karandinos, S. Nan, J.W. Mays, and N. Hadjichristidis, Macromolecules, 24, 2007-2010 (1991).

34. Modern Methods of Polymer Characterization, H.G. Barth and J.W. Mays, Eds. Wiley-Interscience, New York, (1991).

35. "Temperature Dependence of Chain Dimensions for Highly Syndiotactic Poly(methyl methacrylate)," J.W. Mays, S. Nan, W. Yunan, J. Li, and N. Hadjichristidis, Macromolecules, 24, 4469 – 4471 (1991).

36. "Polymer Characterization Using Dilute Solution Viscometry," J.W. Mays and N. Hadjichristidis, in Modern Methods of Polymer Characterization, H.G. Barth and J.W. Mays, Eds., Wiley-Interscience, pp. 227–69 (1991).

37. "Transport Properties of Polyisobutylene in Dilute Solution," J.W. Mays, J.S. Lindner, W.W. Wilson, N. Hadjichristidis, and L.J. Fetters, Macromolecules, 24, 3127-3135 (1991).

38. "Poly(alkylene phosphates): Synthetic Strategies," G.M. Gray, K.E. Branham, L.-H. Ho, J.W. Mays, P.C. Bharara, A. Hajipetrou, and J.B. Beal, Proceedings of Symposium on Inorganic Polymers, 33rd IUPAC International Symposium on Macromolecules, pp. 249-62 (1991).

39. "Subtheta Hydrodynamic Behavior of Poly(α-methystyrene) in Cyclohexane," J.W. Mays, N. Hadjichristidis, W.W. Wilson, and J.S. Lindner, Macromolecules, 24, 6725-6729 (1991).

40. Chain Flexibility of Polymers: Characterization and Structural Relationships, Z. Xu, J.W. Mays, and N. Hadjichristidis, East China University of Chemical Technology Press, Shanghai, (1991).

41. "Hydrodynamic and Thermodynamic Properties of Poly(α- methylstyrene) in Dilute n-Butyl Chloride Solution," J.W. Mays, S. Nan, and M.E. Lewis, Macromolecules, 24, 4857-4860 (1991).

42. "An Analysis of Dilute Solution Properties of Polystyrene in 2-Butanone in Terms of the Hard-Sphere Model," M.E. Lewis, J.W. Mays, S. Nan, W. Yunan, J. Li. and N. Hadjichristidis, Macromolecules, 6686-6689 (1991).

43. "Conformational Characteristics of Some Model Polydienes and Polyolefins," P. Hattam, S. Gauntlett, J.W. Mays, N. Hadjichristidis, R.N. Young, and L.J. Fetters, Macromolecules, 24, 6199-6209 (1991).

44. "Unperturbed Dimensions and Temperature Coefficients of Polymethacrylates with Hydrocarbon Side Groups," N. Hadjichristidis, Z. Xu, and J.W. Mays, Chimika Chronika, New Series (Greece), 20, 39-39 (1991).

45. "Manipulating Solid Surface Properties with Polymeric Agents", H. Watanabe, S.S. Patel, J.F. Argillier, E.E. Parsonage, J. Mays, N. Dan, and M. Tirrell, Mat. Res. Soc. Symp. Proceedings, 249, 255 (1992).

46. "Polymer Solution Properties of a Phenol-Formaldehyde Resole Resin by Gel Permeation Chromatography, Intrinsic Viscosity, Static Light Scattering and Vapor Pressure Osmometric Methods," M.G. Kim, W.L. Nieh, T. Sellers, Jr., W.W. Wilson, and J.W. Mays, Industrial and Engineering Chemistry: Research, 31, 973-979 (1992).

47. "Dilute Solution Properties of Branched Macromolecules," J.W. Mays and N. Hadjichristidis, J. Appl. Polym. Sci., Applied Polym. Symp., 51, 55-72 (1992).

48. "Measurement of the Second Normal Stress Difference for Star Polymers with Highly Entangled Branches," C.S. Lee, J.J. Magda, K.L. DeVries and J.W. Mays, Macromolecules, 25, 4744-4750 (1992).

49. "Mark-Houwink-Sakurada Coefficients for Conventional Poly(methyl methacrylate) in Tetrahydrofuran", Y.-J. Chen, J. Li, N. Hadjichristidis and J.W. Mays, Polymer Bulletin, 30, 575-578 (1993).

50. "Molecular Weight and Molecular Weight Distribution," A.D. Puckett and J.W. Mays, in Handbook of Polyolefins, C. Vasile and R.B. Seymour, Eds., Marcel-Dekker, pp. 133-153 (1993).

51. "On the Birefringence of Symmetric Diblock Copolymers", J. Kim, I. Chin, B.A. Smith, T.P. Russell, and J.W. Mays, Macromolecules, 26, 5436 (1993).

52. "An Evaluation of the DAWN-B Light Scattering Unit from Wyatt Technology: Suggested Calibration, Normalization, and Clarification Procedures," Z. Xu, Y. Wan, J. Li, W.M. Rosenblum, and J.W. Mays, J. Appl. Polym. Sci., 49, 967-973 (1993).

53. "Shear Induced Morphological Structures in Triblock Copolymers", F. A. Morrison, A. Nakatani, M. Muthukumar, C.C. Han, and J.W. Mays, Macromolecules, 26, 5271-73 (1993).

54. "A Direct Observation of Reptation at Polymer Interfaces", T.P. Russell, V.R. Deline, W.R. Dozier, G.P. Felcher, G. Agrawal, R.P. Wool, and J.W. Mays, Nature, 365, 235-37 (1993).

55. "Association of End Functionalized Block Copolymers. Light Scattering and Viscometric Studies", S. Pispas, N. Hadjichristidis, and J.W. Mays, Macromolecules, 27, 6307-6317 (1994).

56. "Dilute Solution Properties of Poly(tert-butyl styrene)," A. George, W.W. Wilson, J.S. Lindner, and J.W. Mays, Polymer, 35, 600 (1994).

57. "The Influence of Alkylene Spacers on Thermal and Conformational Properties of Poly(aryl methacrylates)", Y.-J. Chen, J.W. Mays, and N. Hadjichristidis, J. Polym. Sci., Polym. Phys. Ed., 32, 715 (1994).

58. "Synthesis, Solution Properties, and Glass Transition Temperatures of Polymethacrylates with Alicyclylmethyl Side Groups," D. Pateropoulou, E. Siakali-Kioulafa, N. Hadjichristidis, S. Nan, and J.W. Mays, Makromol. Chem., 195, 173-180 (1994).

59. "Synthesis and Characterization of Star Branched Poly(methyl methacrylate)," V. Efstratiadis, G. Tselikas, N. Hadjichristidis, J. Li, Y. Wan, and J.W. Mays, Polymer International, 33, 171-179 (1994).

60. "Hydrodynamic and Thermodynamic Properties of Well-Defined Polymers in Various Solvents", J.W. Mays, J.S. Lindner, L.J. Fetters, and N. Hadjichristidis, J. Phys. Chem. Ref. Data, 23, 619-640 (1994).

61. "Reptation at Interdiffusing Polymer Interfaces" G. Agrawal, R.P. Wool, W.D. Dozier, G.P. Felcher, T.P. Russell, and J.W. Mays, Macromolecules, 27, 4407-4409 (1994).

62. "Temperature-Induced Conformational Transitions in Flexible Polymer Chains in Solution: A Reevaluation", J.W. Mays, N. Hadjichristidis, E. Bitterlin, W.K. Nonidez, S. Nan, and L.J. Fetters, Polymer, 35, 4638-4647 (1994).

63. "Structure/Chain Flexibility Relationships of Polymers," Z. Xu, N. Hadjichristidis, J.W. Mays, and L.J. Fetters, Advances in Polymer Science, 120, 1-50 (1995).

64. "Free-Standing Black Films: A Model of Charged Polymer Brushes in Interaction", P. Guenoun, A. Schalchli, D. Sentenac, J.W. Mays, and J.J. Benattar, Phys. Rev. Lett., 74, 3628-3631 (1995).

65. "Solution Properties and Lyotropic Mesophase Behavior of Cellulose Propionate," W. Casey, A. George, W.W. Wilson, J.S. Lindner, J.W. Mays, N. Hadjichristidis, and D.G. Peiffer, J. Polym. Sci., Polym. Phys. Ed., 33, 1537-44 (1995).

66. "Hydrodynamic Properties of Model 3-Miktoarm Star Copolymers", H. Iatrou, E. Siakali-Kioulafa, N. Hadjichristidis, J. Roovers, and J.W. Mays, J. Polym. Sci., Polym. Phys. Ed., 33, 1925-32 (1995).

67. "Third Virial Coefficients of Polystyrene in Different Theta Solvents", J. Li, Y. Wan, Z. Xu, and J.W. Mays, Macromolecules, 28, 5347-52 (1995).

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69. "Adsorption of Hydrophilic-Hydrophobic Block Copolymers on Silica from Aqueous Solutions", C. Amiel, M. Sikka, J.W. Schneider, M. Tirrell, and J.W. Mays, Macromolecules, 28, 3125-3134 (1995).

70. "A Shear-Induced Martensitic-Like Transformation in a Block Copolymer Melt", C.L. Jackson, K.A. Barnes, F.A. Morrison, J.W. Mays, A.I. Nakatani, and C.C. Han, Macromolecules, 28, 713-722 (1995).

71. "Synthesis and Characterization of Poly(vinylcyclohexane) Derivatives", M.D. Gehlsen, P. Weiman, F.S. Bates, S. Harville, J.W. Mays, and G.D. Wignall, J. Polym. Sci., Polym. Phys. Ed., 33, 1527-36 (1995).

72. "Synthesis and Characterization of Substituted Poly(vinyl cyclohexane) Derivatives", M.D. Gehlsen, P.A. Weimann, F.S. Bates, J.W. Mays, and G.D. Wignall, Annu. Tech. Conf. - Soc. Plast. Eng., 53 No. 2, 1955-59 (1995).

73. "The Effect of Solvent Quality on Pure and Mixed Brushes", C. Chen, N. Dan, S. Dhoot, M. Tirrell, J. Mays, and H. Watanabe, Israel Journal of Chemistry, 35, 41-47 (1995).

74. "Shear-Induced Changes in the Order-Disorder Transition Temperature and the Morphology of a Triblock Copolymer", C.L. Jackson, F.A. Morrison, A.I. Nakatani, J.W. Mays, M. Muthukumar, K.A. Barnes, and C.C. Han, Chapter 16 in Flow-Induced Structure in Polymers (A.I. Nakatani and M.D. Dadmun, Eds.), ACS Symposium Series 597, ACS Press, Washington, pp. 233-245 (1995).

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Cyclohexane Below the Theta Temperature", J. W. Mays, invited presentation at East China University of Science and Technology, June 30, 1993, Shanghai, China.

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66. "Some Recent Advances in the Synthesis of Well-Defined Polymers and Copolymers by Controlled Anionic Polymerization", J. W. Mays, presented to the Department of Chemistry, University of Alabama, Tuscaloosa, AL, November 11, 1993.

67. "Second Virial Coefficients and Radii of Gyration for Poly (a-methylstyrene) in Cyclohexane Below the Theta Temperature", J. Li and J. W. Mays, invited presentation at the Stockmayer Symposium, ACS National Meeting, San Diego, CA, March 13-17, 1994. See also: *Polymer Preprints*, 35(1), 130 (1994).

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74. "Synthesis and Characterization of Titanium-Containing Polymers for Use in Laser Fusion Experiments at Lawrence Livermore National Laboratory", K. Branham, G. Gray, J. Mays, R. Cook, G. Overturf, and R. Sanner, presented at Alabama Academy of Science Meeting, Troy, AL, March 23-26, 1994.

75. "Synthesis and Morphology of Flexible/Semi-Rigid Block Copolymers", J. Zhou and J. W. Mays, presented at Alabama Materials Research Society Meeting, Tuscaloosa, AL, April 12, 1994.

76. "What's New in Anionic Polymerization", J. W. Mays, presented to the Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, April 15, 1994.

77. "Some Unsolved Problems in Polymer Solutions", J. W. Mays, presented to the Department of Chemistry, University of Minnesota, Minneapolis, MN, April 22, 1994.

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79. "The Micellization Features of Diblock and Starblock Copolymers in Selective Solvents", Z. Xu, L. Bu, T. Huang, and J. W. Mays, presented at the 35th IUPAC Symposium on Macromolecules, Akron, OH, July 11-15, 1994.

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81. "Aqueous Micellar Solutions of Hydrophobically Modified Polyelectrolytes", J. W. Mays, P. Guenoun, H. T. Davis, and M. Tirrell, invited poster at the Polymer Physics Gordon Conference, NewPort, Rhode Island, July 31 - August 5, 1994.

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83. "Preparation and Functionalization of Polyphosponates", P. C. Bharara, J. B. Beal, J. Rong, K. E. Branham, J. W. Mays, and G. M. Gray, presented at the Southeast Regional ACS Meeting, Birmingham, October 16-19, 1994.

84. "$Cr(CO)_3$ - Substituted Polystyrene as a Third Order NLO Material", D. C. Gale, C. M.

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85. "Synthesis and Characterization of Titanium - Containing Copolymers for Use in Laser Fusion Experiments", K. E. Branham, G. M. Gray, J. W. Mays, R. Cook, G. Overturf, and R. Sonner, presented at the Southeast Regional ACS Meeting, Birmingham, October 16-19, 1994.

86. "Synthesis and Morphological Study of Flexible/Semi-Rigid Diblock Copolymer (Polyisoprene - Poly(t-butyl methacrylate)), J. Zhou, J. W. Mays, S. P. Gido, and D. Pochan, presented at the Southeast Regional ACS Meeting, Birmingham, October 16-19, 1994.

87. "The Effect of Surface Curvature on Polyelectrolyte Diblock Copolymer Adsorption on Silica", R. Hariharan, J. Mays, J.Zhou, and W. B. Russel, presented at AICHE Conference, San Francisco, CA, November 1994.

88. "Association Behavior of End Functionalized Diblock Copolymers of Styrene and Isoprene in n-Decane", S. Allorio, S. Pispas, N. Hadjichristidis, and J. Mays, invited poster presentation at the Gordon Research Conference on Polymers, Ventura, CA, January 8-13, 1995.

89. "Microphase Separated Morphologies in Conformationally Asymmetric Diblock Copolymers", D. J. Pochan, S. P. Gido, J. Zhou, and J. Mays, invited poster presentation at the Gordon Research Conference on Polymers, Ventura, CA, January 8-13, 1995.

90. "Some Recent Advances in Anionic Polymerization", J. W. Mays, presented at Georgia Institute of Technology, School of Chemistry and Biochemistry, Atlanta, GA, March 1, 1995.

91. "Effect of Deuteration on Polymer Chain Dimensions", Z. Xu, Y. Wan, T. Huang, S. Pispas, and J. W. Mays, presented at the Second China-Korea Polymer Symposium, Seoul, South Korea, May 10-17, 1995.

92. "Characterization of Long-Chain Branching by Solution Methods", J. W. Mays, invited presentation at the Fourth Mediterranean School and Symposium on Science and Technology of Advanced Polymer-Based Materials, Fodele-Crete (Greece), June 5-9, 1995.

93. "Conformational and Branching Asymmetry in Block Copolymers", J. W. Mays, invited presentation at the Institute of Electronic Structure and Laser (IESL), Research Center of Crete, Heraklion - Crete (Greece), June 9, 1995.

94. "Block Copolymers of Unusual Architecture", J. W. Mays, invited presentation at CEA - Saclay, Saclay, France, June 14, 1995.

95. "Graft Copolymers of Polystyrene and Polymethacrylic Acid or Poly(2-vinyl-pyridine): Synthesis and Characterization", M. Pitsikalis and J. W. Mays, presented at the 47th Southeast/51st Southwest ACS Joint Regional Meeting, Memphis, TN, November 29 - December 1, 1995.

96. "Solution and Solid State Properties of Linear Block Copolymers with Zwitterionic End Groups", S. Pispas, N. Hadjichristidis, J. W. Mays, G. Floudas, and G. Fytas, presented at the 47th Southeast/51st Southwest ACS Joint Regional Meeting, Memphis, TN, November 29 - December 1, 1995.

97. "Synthesis and Characterization of Model Graft Copolymers", S. Pispas, J. W. Mays, D. J. Pochan and S. P. Gido, presented at the 47th Southeast/51st Southwest ACS Joint Regional Meeting, Memphis, TN, November 29 - December 1, 1995.

98. "Association Behavior of Three-Arm-Star Polybutadienes with Different Numbers of Functional Endgroups", M. Pitsikalis, N. Hadjichristidis, and J. W. Mays, presented at the 47th Southeast/51st Southwest ACS Joint Regional Meeting, Memphis, TN, November 29 - December 1, 1995.

99. Morphological Study on Flexible/Semi-Rigid Polyisoprene/poly(t-butyl methacrylate) Diblock Copolymer", J. Zhou, J. W. Mays, D. J. Pochan, and S. P. Gido, presented at the 47th Southeast/51st Southwest ACS Joint Regional Meeting, Memphis, TN, November 29 - December 1, 1995.

100. "Characterization of Stabilized Dispersion of Core-Shell Structure of Polybutyl methacrylate on Silica Spheres", L. Bu, Z. Xu. X. Mo, and J. W. Mays, presented at the 47th Southeast/51st Southwest ACS Joint Regional Meeting, Memphis, TN, November 29 - December 1, 1995.

101. "A Study on Chain Flexibility of Semi-Rigid Poly(tert-butylmethacrylate)", J. Zhou, Y. Wan, and J. W. Mays, presented at the Alabama Academy of Science Meeting, Tuskegee, AL, March 6-9, 1996.

102. "Graft Copolymers of Styrene and Methacrylic Acid or Vinyl Pyridine, Synthesis and Characterization", M. Pitsikalis and J. W. Mays, presented at the Alabama Academy of Science Meeting, Tuskegee, AL, March 6-9, 1996.

103. "Synthesis and Characterization of a Stabilized Dispersion of Polybutylmethacrylate Grafted onto Silica Spheres", L. Bu, J. W. Mays, J. Yang, X. Mo, and Z. Xu, presented at the Alabama Academy of Science Meeting, Tuskegee, AL, March 6-9, 1996.

104. "Micelles Formed by a Model Ionic Graft Copolymers", C. L. Gettinger, C. L. Jackson, C. C. Han, M. Pitsikalis, and J. W. Mays, presented at the 211th National ACS Meeting, New Orleans, March 24-28, 1996 (see also *Polymer Preprints*, 37(1), 406 (1996).

105. "Synthesis and Morphology of Model Poly(isoprene-graft-styrenes)", S. Gido, N. Hadjichristidis, C. Lee, J. W. Mays, S. Pispas, M. Pitsikalis, and D. Pochan, presented at the 9th International Symposium on Polymer Analysis and Characterization, Oxford, England, July 1-3, 1996.

106. "Block Copolymer Films on Random Copolymer Brushes", P. Mansky, T. Russell, S. Satija, and J. W. Mays, invited poster presented at the Gordon Research Conference on Polymer Physics, Newport, Rhode Island, July 14-18, 1996.

107. "Test of the Constitutive Hypothesis of Melt Fracture: Shear Behavior of Polybutadienes and Polyisoprenes", P. R. Manjeshwar, F. A. Morrison, and J. W. Mays, presented at the XIIth International Congress on Rheology, Quebec City, Canada, August 18-23, 1996.

108. "Synthesis, Morphology, and Properties of Model Graft and Flexible/Semi-Rigid Block Copolymers", J. W. Mays and S. Gido, presented at the United States Army Research Laboratory, Wilmington, DE, August 20, 1996.

109. "Calculation of Branching Distributions from SEC-LS-Viscometry Measurements of the Dilute Solution Properties of Randomly Branched Poly(methylmethacrylate)", C. Jackson, Y.-J. Chen, and J. W. Mays, presented at the Waters International GPC Symposium, San Diego, CA, September 8-11, 1996.

110. "Synthesis and Morphology of Model Non-Linear Block Copolymers of H and Pi Shape", Y. Poulos, S. Pispas, N. Hadjichristidis, J. Mays, and S. Gido, invited presentation at the 6th European Polymer Federation Symposium on Polymeric Materials, Aghia Pelaghia, Crete, Greece, October 7-11, 1996.

111. "Self-Diffusion of Linear and Non-Linear Block Copolymers", K. Chrissopoulou, S. H. Annastasiadis, G. Fytas, G. Fleischer, K. Adachi, J. Mays, S. Pispas, M. Pitsikalis, and N. Hadjichristidis, invited presentation at the 6th European Polymer Federation Symposium on Polymeric Materials, Aghia Pelaghia, Crete, Greece, October 7-11, 1996.

112. “Long-Range Order Morphologies of a Lamellar Triblock Copolymer Under Shear”, K. A. Barnes, F. A. Morrison, J. D. Barnes, J. W. Mays, C. L. Jackson, and S. Satoor, presented at the AICHE National Conference, November 1996.

113. “Development and Evaluation of a Rubber-Toughened Orthopaedic Bone Cement Formulation”, A. D. Puckett, B. Roberts, L. Bu, and J. W. Mays, presented at the meeting on Molecular Engineering of Polymers: Directing Biological Response (sponsored by Polymer Division of ACS), Santa Barbara, CA, November 22-24, 1996.

114. “Effect of Architecture on the Self-Diffusion in Block Copolymer Solutions: I_2S Simple Grafts”, G. Fleischer, S. H. Anastasiadis, K. Chrissopoulou, G. Fytas, S. Pispas, M. Pitsikalis, J. Mays, and N. Hadjichristidis, presented at the American Physical Society

Meeting, Kansas City, MO, March 17-21, 1997.

115. "Architectural Control of Graft Copolymer Morphology", S. P. Gido, C. Lee D. J. Pochan, J. W. Mays, and N. Hadjichristidis, presented at the Apring 1997 Meeting of the Materials Research Society, San Francisco, CA, March 31 - April 3, 1997.

116. "Manipulating Surface Interactions to Control Diblock Copolymers", T. P. Russell, P. Mansky, E. Huang, L. Rockford, Y. Liu, C. Hawker, and J. W. Mays, presented at the Spring 1997 Meeting of the Materials Research Society, San Francisco, CA, March 31 - April 3, 1997.

117. "Effect of Conformational and Architectural Asymmetry on Long Range Order in Microphase Separated Block Copolymers", S. P. Gido, D. Pochan, and J. W. Mays, presented at the Spring 1997 Meeting of the Materials Research Society, San Francisco, CA, March 31 - April 3, 1997.

118. "Synthesis and Properties of Model Graft Copolymers", Jimmy W. Mays, presented at the Department of Polymer Science, University of Southern Mississippi, May 7, 1997.

119. "Synthesis and Properties of Model Graft Copolymers", Jimmy W. Mays, presented at Proctor and Gamble Central R & D Labs, Cincinnati, OH, June 6, 1997.

120. "Synthesis and Properties of Model Graft Copolymers", Jimmy W. Mays, presented at the University of Mississippi, Oxford, MS, September 12, 1997.

121. "Analysis of Radiation Degradation in Kel-F by SEC", G.E. Overturf, J.D. Lemay, J. Mays, L. Bu, and Yunan Wan, presentation at the 21st Aging, Compatibility, and Stockpile Stewardship Conference, presented at Sandia National Laboratories, Albuquerque, NM, October 2, 1997.

122. "Synthesis and Properties of Model Graft Copolymers", Jimmy W. Mays, invited presentation to celebrate the 30th anniversary of the Department of Polymer Science at the University of Akron, Akron, OH, October 17, 1997.

123. "Characterization of Fractionated and Unfractionated Polymer by MALDI/TOF/MS", H. Ji, W.K. Nonidez, and J.W. Mays, invited present at the meeting on Application of MALDI-TOF and ESI-TOF Mass Spectrometry In the Characterization of Synthetic and Biological Polymers, Catania, Italy, October 30-31, 1997.

124. "Characterization of Fractionated and Unfractionated Polymers by MALDI/TOF/MS", H. Ji, W.K. Nonidez, and J.W. Mays, invited presentation at the Department of Chemistry, University of Athens, Athens, Greece, November 4, 1997.

125. "The Chain Flexibility of Poly(oxymethylene)", Zhongde Xu, Chengwei Su, Dun Li, Yi Huang, and J. W. Mays, presented at The International Microsymposium on

Polymer Physics, PP '97, Guilin, November 25-29, 1997, Guilin, China.

126. "Hollow Cylinder, Core-Shell Morphology in Blends of Diblock Copolymers and Homopolymers", S.P. Gido, J. David, D. Pochan, J.W. Mays, J. Zhou, K. Hong, and N. Beck Tan, invited presentation at the Twenty First Asilomar Conference on Polymeric Materials, sponsored by U.S. Army, February 22-25, 1998, Pacific Grove, CA.

127. "Controlled Architecture Graft Copolymers by Anionic Polymerization", J.W. Mays, H. Iatrou, Y. Poulos, S. Pispas, M. Pitsikalis, K. Hong, N. Hadjichristidis, S. Gido, D. Pochan, C. Lee, F. Beyer, N. Beck Tan, and S. Trevino, invited presentation at the Twenty First Asilomar Conference on Polymeric Material, sponsored by U.S. Army, February 22-25, 1998, Pacific Grove, CA.

128. "Synthesis and Properties of Model Graft Copolymers", J. W. Mays, H. Iatrou, Y. Poulos, S. Pispas, M. Pitsikalis, K. Hong, N. Hadjichristidis, S. Gido, D. Pochan, C. Lee, F. Beyer, N. Beck Tan presented at Samford University, February 26, 1998, Birmingham, AL.

129. "Controlled Architecture Graft Copolymers by Anionic Polymerization", J.W. Mays, presented at East China University of Science and Technology, March 19, 1998, Shanghai, China.

130. "Understanding the Effect of Long Chain branching on Polymer Properties: Synthesis, Molecular Characterization, and Properties of Novel Branched Polymer Architecture", J.W. Mays, presented at Dow Chemical Company, April 16, 1998, Midland, Michigan.

131. "Temperature Gradient Interaction Chromatography of Polymers", T. Chang, W. Lee, H.C. Lee, J.W. Mays, S. Harville, and D.J. Frater, presented at the Society of Plastics Engineers ANTEC '98 Meeting, April 29, 1998, Atlanta, Georgia; extended abstract published in *Proceedings of the Society of Engineers Technical Papers*, Vol. XLIV, number 2, (1998).

132. "Polydispersity Analysis of Fractionated Synthetic Polymers by MALDI/TOF Mass Spectrometry", H. Ji, W.K. Nonidez, and J.W. Mays, presented at the Society of Plastics Engineers ANTEC '98 Meeting, April 29, 1998, Atlanta, Georgia; extended abstract published in *Proceedings of the Society of Engineers Technical Papers*, Vol. XLIV, number 2 (1998).

133. "A MALDI/TOF/MS and SEC Study of ASTRAMOL Dendrimers having Cyano End Groups", L. Bu, W.K. Nonidez, J.W. Mays, and N. Beck Tan, presented at the 11th International Symposium of Polymer Analysis and Characterization, May 25-27, 1998, Santa Margherita Ligure, Italy.

134. "Recent Developments in the Anionic Synthesis of Model Graft Copolymers", Jimmy W. Mays, Keynote Address at the NATO/ASI Meeting on Ionic Polymerization and

Related Processes, August 9 - 21, 1998, London, Ontario, Canada.

135. "Synthesis and Characterization of Poly(cyclohexadiene) Polymers", K. Hong, Y. Nakamura, J.W. Mays, J.L. David, and S.P. Gido, invited poster at the Polymer Physics Gordon Conference, August 9 - 14, 1998, Newport, Rhode Island.

136. "Achieving Precise Control of Branching in Graft Copolymers", J.W. Mays, presented to the Department of Polymer Science and Engineering, University of Massachusetts, Amherst, MA, September 25, 1998.

137. "SEC and MALDI Measurements to Determine the Degradation Mechanisms of Estane in Polymer Bound Explosives", G. E. Overturf, III, J. D. LeMay, B. Russell, W. Nonidez, J. W. Mays, and H. Ji, presented at Waters GPC Symposium, Phoenix, Oct. 4 -7, 1998.

138. "Characterization of KEL-F 800 Degradation Under Irradiation Using DRI/Visc. SEC", G. E. Overturf, III, J. D. LeMay, J. W. Mays, L. Bu, and Y. Wan, presented at Waters GPC Symposium, Phoenix, Oct. 4 - 7, 1998.

139 "Determination of Molecular Weight, Molecular Weight Distribution and Impurities of Astramol Dendrimers via SEC and MALDI/TOF/MS", L. Bu, W. K. Nonidez, J. W. Mays, and N. Beck-Tan, presented at the Southeast Regional Meeting of the American Chemical Society, Research Triangle Park, NC, November 4-7, 1998.

140. "Solution Properties of Semi-Rigid Polycyclohexadiene and Semirigid/Flexible Polycyclohexadiene-Polystyrene Copolymers", K. Hong, Y. Nakamura, and J. W. Mays, presented at the Southeast Regional Meeting of the American Chemical Society, Research Triangle Park, NC, November 4-7, 1998.

141. "MALDI-TOF MS and TGIC Study of a Series of Polystyrenes Only Different in Their End Capping", H. Ji, W. K. Nonidez, J. W. Mays, and T. Chang, presented at the Southeast Regional Meeting of the American Chemical Society, Research Triangle Park, NC, November 4-7, 1998.

142. "Dimensions of Comb-Branched Polystyrene in Solution. Dependence on the Spacer Length Between Branches", Y. Nakamura and J .W. Mays, presented at the Southeast Regional Meeting of the American Chemical Society, Research Triangle Park, NC, November 4-7, 1998.

143. "Simple Tetrafunctional Graft Copolymers, A_2B_2, of Polystyrene and Polyisoprene: Synthesis, Characterization and Study of Architectural Effect on Morphology" D. Uhrig, J. W. Mays, S. P. Gido, N. Beck-Tan, and F. L. Beyer III, presented at the Southeast Regional Meeting of the American Chemical Society, Research Triangle Park, NC, November 4-7, 1998.

144. "Novel Glass Ionomer-Based Orthopaedic Bone Cements", J. W. Mays, presented at Howmedica Research, Newark, New Jersey, November 16, 1998.

145. "Synthesis of Novel Graft Copolymer Architectures by Anionic Polymerization", J.W. Mays, presented at the University of Tennessee, Department of Chemistry, Knoxville, November 19, 1998.

146. "Effect of Deuteration on Polymer Chain Dimensions: The Dilute Solution Viscosity Investigation", Z. Xu, Y. Huang, C. Su, D. Li, Y. Wan, S. Pispas, J.W. Mays, and C. Wu, presented at the 2nd East Asian Polymer Conference, Hong Kong, China, January 12-16, 1999.

147. "Synthesis of Macromolecules With Diverse Architectures", J. W. Mays, invited lecture at the Polymers West Gordon Conference, Ventura, CA, January 14, 1999.

148. "Polyelectrolyte Brushes", J. W. Mays, presented at Hewlett-Packard Company, Palo Alto, California, January 15, 1999.

149. "Novel Graft Copolymer Architectures", J. W. Mays, presented at the Department of Chemistry, Southern Illinois University, Carbondale, IL, February 12, 1999.

150. "New Model Graft Copolymers", J. W. Mays, presented at the Department of Chemistry, Louisiana State University, Baton Rouge, LA, March 12, 1999.

151. "SEC and Thermal Analysis Comparison of Various Expandable Polystyrene Beads", L. Bu, Y. Wan, H. E. Littleton, and J. W. Mays, presented at the 76th Annual Meeting of the Alabama Academy of Science, Athens State University, March 26, 1999.

152. "Morphology of Regular Multigraft Copolymers with Tetrafunctional Branch Points", F. L. Beyer, S. P. Gido, H. Iatrou, D. Uhrig, J. W. Mays, and N. Beck Tan, presented at the 1999 Centennial Meeting of the American Physical Society, Atlanta, GA, March 20-26, 1999 (see also: *Bull. Amer. Phys. Soc*., 44 (1), 534 (1999)).

153. "Controlling the Orientation of Cylindrical Domains in Block Copolymer Films by Balancing Interfacial Interactions", E. Huang, T. P. Russell, C. Hawker, and J. W. Mays, presented at the 1999 Centennial Meeting of the American Physical Society, Atlanta, GA, March 20-26, 1999 (see also: *Bull. Amer. Phys. Soc*., 44(1), 1451 (1999)).

154. "Structure and Interaction of Polyelectrolyte Brushes", P. Guenoun, F. Muller, M. Delsanti, L. Auvray, Y. J. Chen, J. W. Mays, and M. Tirrell, presented at the 1999 Centennial Meeting of the American Physical Society, Atlanta, GA, March 20-26, 1999 (see also: *Bull. Amer. Phys. Soc*., 44(1), 1761 (1999)).

155. "New Polymer Architectures by Anionic Polymerization", J. W. Mays, presented to the Department of Polymer Science, Penn State University, State College, PA, April 8,

1999.

156. "Manipulating Block Copolymer Architectural and Conformational Asymmetry", J. W. Mays, invited presentation at the U. S. Army-Sponsored Workshop on Flexible Barrier Materials for the Soldier System, Natick Research Development and Engineering Center, Natick, MA, April 14-15, 1999.

157. "MALDI Analysis of Estane Degradation", G. E. Overturf III, J. D. Lemay, B. Russell, W. Nonidez, J. Mays, H. Ji, and E. M. Kober, presented at the 22nd Aging, Compatibility and Stockpile Stewardship Conference, Oak Ridge, TN, April 27 – 30, 1999.

158. "Improved Orthopaedic Bone Cement Formulations Based Upon Rubber Toughening", A. D. Puckett, B. Roberts, L. Bu, and J. W. Mays, presented at the Southern Biomedical Engineering Conference, Clemson, SC, May 21-23, 1999.

159. "Synthesis of Well-Defined Neutral/Ionic Block Copolymers", J. Yang and J. W. Mays, presented at The Fourth Claude Itzykson Meeting: Theoretical Approaches to Biological and Soft Systems, CEA-Saclay, Saclay, France, June 22-25, 1999.

160. "Experiments on Charged Spherical Micelles in Aqueous Solutions", F. Muller, P. Guenoun, M. Delsanti, Y.-J. Chen, and J. W. Mays, presented at the Fourth Claude Itzykson Meeting: Theoretical Approaches to Biological and Soft Systems, CEA-Saclay, Saclay, France, June 22-25, 1999.

161. "Small Angle Neutron Scattering and X Ray Scattering Methods Applied to Block Copolymers", P. Guenoun, F. Muller, P. Fontaine, M. Delsanti, L. Auvray, Y.-J. Chen, J. Yang, J. W. Mays, M. Tirrell, B. Deme, and P. Lesieur, presented at the 12th International Symposium on Polymer Analysis and Characterization, La Rochelle, France, June 28-30, 1999.

162. "Characterization of Charged Spherical Brushes Using Dynamic Light Scattering", F. Muller, M. Delsanti, J. Yang, J. W. Mays, and P. Guenoun, presented at the 12th International Symposium on Polymer Analysis and Characterization, La Rochelle, France, June 28-30, 1999.

163. "A MALDI-TOF-MS Study of Amphiphilic Block Copolymers Based On Sulfonated Polystyrene", J. Yang, W. K. Nonidez, and J. W. Mays, presented at the 12th International Symposium on Polymer Analysis and Characterization, La Rochelle, France, June 28-30, 1999.

164. "A Fluorescence Study of Micellization of NaPSS/PtBS Amphiphilic Block Copolymers in Aqueous Solution", J. Yang, Y. Wang, R. Advincula, J. W. Mays, and P. Guenoun, presented at the 12th International Symposium on Polymer Analysis and Characterization, La Rochelle, France, June 28-30, 1999.

165. "Dilute Solution Properties of Star-branched Polystyrene in the Good Solvent Benzene and Two Theta Solvents, Cyclohexane and Diethyl Malonate", S.R. Harville, J.W. Mays, presented at New Orleans National ACS Meeting, August 1999. See also *Polymer Preprints*, 40(2), 643 (1999).

166. "Thermal Analysis of Polystyrene Beads for Lost Foam Casting", L. Bu, Y. Wan, H. Littleton, J.W. Mays, presented at New Orleans National ACS Meeting, August 1999. See also *Polymer Preprints*, 40(2), 689 (1999).

167. "Synthesis of Model Graft Copolymers with Regularly Spaced Trifunctional or Tetrafunctional Branch Points", K. Hong, D. Uhrig, H. Iatrou, Y. Poulos, N. Hadjichristidis, J.W. Mays, invited presentation at New Orleans National ACS Meeting, August 1999. See also *Polymer Preprints*, 40(2), 104 (1999).

168. "Block Copolymer Amphiphiles of Different Architectures Investigated Using the Quartz Crystal Microbalance Technique: In Situ Investigation of Adsorption Properties", R.C. Advincula, M-K. Park, A. Baba, F. Kaneko, J. Yang, J. Mays, presented at New Orleans National ACS Meeting, August 1999. See also *Polymer Preprints*, 40(2), 1001 (1999)

169. "A MALDI/ TOF/ MS Study of Homopolymers and Amphiphilic Diblock Copolymers Based on Sulfonated Polystyrene", J. Yang, W.K. Nonidez, J.W. Mays, presented at New Orleans National ACS Meeting, August 1999. See also *Polymer Preprints*, 40(2), 1043 (1999).

170. "Synthesis and Characterization of Poly(1,3-cyclohexadiene)-Polystyrene Block Copolymers", K. Hong, J.W. Mays, W.A. Cristofoli, presented at New Orleans National ACS Meeting, August 1999. See also *Polymer Preprints*, 40(2), 1064 (1999).

171. "Subphase Adsorption of Polyelectrolytes to Block Copolymer Amphiphiles at the Air-Water Interface: In Situ Investigations Using the Quartz Crystal Microbalance Technique and the Langmuir-Blodgett Trough", R.C. Advincula, M-K. Park, J. Yang, J. Mays, presented at New Orleans National ACS Meeting, August 1999. See also *Polymer Preprints*, 40(2), 1084 (1999).

172. "Adsorption of Hydrophobically Modified Polyelectrolytes from Dilute Aqueous Solution at the Solid/ Liquid Interface", R.G. Toomey, P.A. Schorr, M.V. Tirrell, F.S. Bates, Y. Wang, R. Advincula, J.W. Mays, presented at New Orleans National ACS Meeting, August 1999. See also *Polymer Preprints*, 40(2), 1010 (1999).

173. "Charged Stars Formed by Association of Charged-Neutral Block Copolymers", P.M. Guenoun, F. Muller, P. Fontaine, M. Delsanti, L. Auvray, Y. Chen, J. Yang, J.W. Mays, M. Tirrell, B. Demé, P. Lesieur, presented at New Orleans National ACS Meeting, August 1999. See also *Polymer Preprints*, 40(2), 1018 (1999).

174. "Branching in Block Copolymers: Development of Structure-Property Relationships", Jimmy Mays, presented at the Department of Chemical Engineering, University of Alabama, Tuscaloosa, AL, January 20, 2000.

175. "Synthesis and Properties of Model Branched Copolymers and Homopolymers", Jimmy Mays, presented at the Department of Chemistry, University of Chicago, Chicago, IL, February 7, 2000.

176. "1,3-Cyclohexadiene Polymers: New Materials with Great Potential", KunLun Hong and J. W. Mays, presented at the Alabama EPSCoR Meeting, February 28, 2000, Montgomery, AL.

177. "Polyisoprene and Butyl Rubber Based Graft Copolymer Materials", David Uhrig and J. W. Mays, presented at the Alabama EPSCoR Meeting, Montgomery, AL, February 28, 2000.

178. "Surface-Initiated Anionic Polymerization on Silica and Silicate Surfaces: Surface Investigations on Tethered Polymers", Q. Zhou, Y. Nakamura, S. Inaoka, M-K. Park, Y. Wang, X. Fan, J. Mays, and R. Advincula, presented at the Alabama EPSCoR Meeting, Montgomery, AL, February 28, 2000.

179. "Synthesis, Characterization, and Properties of Well-Defined Ionic/Neutral Block Copolymers", Jimmy Mays, J. Yang, Y. Wang, and R. Advincula, presented at the Spring 2000 National Meeting of the American Chemical Society, San Francisco, CA, March 26-30, 2000. See also: Polymeric Materials Science and Engineering, 82, 201 (2000).

180. "Surface Initiated Anionic Polymerization on Silica and Silicate Surfaces", Q. Zhou, Y. Nakamura, S. Inaoka, M-K. Park, Y. Wang, J. Mays, and R. Advincula, presented at the Spring 2000 National Meeting of the American Chemical Society, San Francisco, CA, March 26-30, 2000. See also: Polymeric Materials Science and Engineering, 82, 290-91 (2000).

181. "A Study of the Side Reactions in Chain End Sulfonated Polystyrene Via Thin Layer Chromatography and MALDI/TOF/MS", H. Ji, W. K. Nonidez, and J. W. Mays, presented at the Spring 2000 National Meeting of the American Chemical Society, San Francisco, CA, March 26-30, 2000. See also: Polymer Preprints, 41(1), 665-66 (2000).

182. "Capillary Waves at Interfaces: The Role of Gravity and Electric Fields", T. Kerle, Z. Lin, S. Baker, J. Mays, and T. P. Russell, presented at the NASA Microgravity Materials Science Conference, Huntsville, AL, June 6-8, 2000.

183. "Controlled Synthesis of Nanoparticles Using Block Copolymers: Nanoreactors in Microgravity Conditions", R. Advincula, J. P. Claude, J. Yang, and J. W. Mays, presented at the NASA Microgravity Materials Science Conference, Huntsville, AL,

June 6-8, 2000.

184. "MALDI/TOF/MS Study of Astramol Dendrimers Having Cyano End Groups", L. Bu, W. K. Nonidez, and J. W. Mays, presented at the 13th International Symposium on Polymer Analysis and Characterization, Pittsburgh, PA, June 19-21, 2000.

185. "Synthesis and Characterization of 1,3-Cyclohexadiene Polymers", K. Hong and J. W. Mays, presented at the 4th National Graduate Polymer Research Conference, Hattiesburg, MS, June 18-21, 2000.

186. "Synthesis of Poly(isobutene-graft-styrene) Using a Commercially Available Butyl Rubber and Anionic Polymerization Techniques", D. Uhrig and J. W. Mays, presented at the 4th National Graduate Polymer Research Conference, Hattiesburg, MS, June 18-21, 2000.

187. "Modification of Poly(carboxylic acids) by Grafting Vinyl Functionality", W. Wu, D. Xie, J. Mays, A. Puckett, and C. Inman, presented at the 4th National Graduate Polymer Research Conference, Hattiesburg, MS, June 18-21, 2000.

188. "MALDI/TOF/MS and SEC Study of Astramol Dendrimers Having Cyano End Groups", L. Bu, W. K. Nonidez, and J. W. Mays, presented at the 4th National Graduate Polymer Research Conference, Hattiesburg, MS, June 18-21, 2000.

189. "CMC Determination of Hydrophobically Modified Polyelectrolytes in Aqueous Solution: A Fluorescence Probe Quenching Study", J. Yang, Y. Wang, and J. W. Mays, presented at the 4th National Graduate Polymer Research Conference, Hattiesburg, MS, June 18-21, 2000.

190. "Characterization of Hydroxy-Terminated Polybutadienes by MALDI-TOF-MS and Other Techniques", W. K. Nonidez and J. W. Mays, presented to Pratt & Whitney, Space Propulsion Division, San Jose, CA, June 30, 2000.

191. "CMC Determination of Asymmetric Poly(4-tert-butylstyrene)-b-sodium poly(styrene sulfonate) in Aqueous Solution", J. Yang, Y. Wang, W. K. Nonidez, and J. W. Mays, presented at the National Meeting of the American Chemical Society, Washington, DC, August 20-24, 2000.

192. "Synthesis and Characterization of Controlled Architecture Ionic/Neutral Block Copolymers", J. Yang and J. W. Mays, invited presentation at the National Meeting of the American Chemical Society, Washington, DC, August 20-24, 2000. See also: Polymer Preprints, 41(2), 1523-24 (2000).

193. "Anionic Polymerization of 1,3-Cyclohexadiene", K. Hong and J. W. Mays, invited presentation at the Symposium honoring Lewis Fetters as Outstanding Alumnus, University of Akron, Department of Polymer Science, October 13, 2000.

194. "Synthesis, Characterization and Properties of New Branched Polymer Architectures", J. W. Mays, Clemson University, October 16, 2000.

195. "Controlled Polymerization Initiated from Clay Surfaces", Qingye Zhou, J. W. Mays, and R. Advincula, presented at The First Georgia Tech Conference on Nanoscience and Nanotechnology, Atlanta, GA, October 16-18, 2000.

196. "SEC Analysis of Estane 5703: Experimentally Derived Constants for Absolute MW Determinations", G. E. Overturf III, P. Lewis, J. Mays, Y. Wan, and L. Bu, presented at the International GPC Symposium 2000, Las Vegas, NV, October 21-25, 2000.

197. "Surface Initiated Anionic Polymerization on Silicate Surfaces", Qingye Zhou, J. W. Mays, and R. Advincula, presented at the Joint Southeast-Southwest Regional Meeting of the American Chemical Society, New Orleans, LA, December 6-8, 2000. See Also, *PMSE Preprints*, 2000, *82*, 291

198. "Formulation of New Hybrid Glass-Ionomer Cements Using New Polymeric Systems and Commercial Glass", M. Chakraborty, D. Xie, and J. W. Mays, presented at the Joint Southeast-Southwest Regional Meeting of the American Chemical Society, New Orleans, LA, December 6-8, 2000.

199. "Anionic Polymerization of 1,3-Cyclohexadiene", K. Hong and J. W. Mays, presented at the Gordon Research Conference on Polymers, Ventura, CA, January 7-11, 2001.

200. "Model Branched Polymers: Synthesis and Structure-Property Relationships", J. W. Mays, presented at The Department of Materials Engineering, University of California at Santa Barbara, January 11, 2001.

201. "Formulation of Hybrid Glass-Ionomer Cements for Biomedical Applications", D. Xie, M. Chakraborty, and J. Mays, presented at the Southern Biomedical Engineering Meeting, Birmingham, AL, February 9-11, 2001.

202. "Synthesis of Poly(carboxylic acids) with Pendant Vinyl Functionality and Mechanical Properties of the Formed Cements", D. Xie, W. Wu, J. Mays, A. Puckett, and C. Inman, presented at the Southern Biomedical Engineering Meeting, Birmingham, AL, February 9-11, 2001.

203. "Polymerization in Ionic Liquids", J. W. Mays, presented for the ARO-sponsored Technology Review on Ionic Liquids, American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001.

204. "Chemistry of Anionic Surface Initiated Polymerization on Surfaces", Q. Zhou, J. Mays, R. Advincula, presented at the American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001.

205. "Nanocomposite Materials by Surface Initiated Polymerization on Silicate, Clay, and Silica Gel Surfaces: Preparation of High Performance Barrier Materials", R.C. Advincula, Q. Zhou, and J. Mays, presented at the American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001.

206. "Anionic Polymerization Initiated from Si-Gel and Clay Nanoparticle Surfaces", Q. Zhou, X. Fan, C. Xia, J. Mays, and R. Advincula, presented at the American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001. See Also, *PMSE Preprints*, *84*, 835, 2001.

207. "Surface Initiated Polymerization on Surfaces: Systems and Strategies Towards Polymer Brush Architectures via Anionic Mechanism", R. C. Advincula, Q. Zhou, and J. W. Mays, presented at the American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001. See Also, *PMSE Preprints*, *84*, 1, 875, 2001.

208. "In Situ Investigation of Adsorption Properties of Block Copolymer Amphiphiles by Surface Plasmon Spectroscopy", R. C. Advincula, J. Mays, W. Knoll, Y. Wang, J. Yang, C. Holloway, S. Seth, M.-K. Park, and J. H. Youk, presented at the American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001. See Also, *Polymer Preprints*, 42(*1*), 285, 2001.

209. "Free Radical Polymerization and Copolymerization in Room Temperature Ionic Liquids", L. Bu, M. Li, H. Zhang, K. Hong, and J. W. Mays, presented at the American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001.

210. "Synthesis of Multistyrenic Aromatic Compounds", W. A. Cristofoli, D. Uhrig, and J. W. Mays, presented at the American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001.

211. "Anionic Polymerization of Styrene and 1,3-Cyclohexadiene", K. Hong and J. W. Mays, presented at the American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001.

212. "Measuring In Situ the Adsorption of Block Copolymer Amphiphiles and Polyelectrolytes at Interfaces: A Comparison of Evanescent, Ellipsometric, and Acoustic Techniques", R. C. Advincula, J. W. Mays, W. Knoll, Y. Wang, J. H. Houk, A. Baba, F. Kaneko, M.-K. Park, and J. Yang, presented at the American Chemical Society National Meeting, San Diego, CA, April 1-5, 2001. See Also, *Polymer Preprints*, *42*, *1*, 281, 2000.

213. "Alphabet Soup with Polymers", J. W. Mays, award lecture for the 2001 Caroline P. and Charles W. Ireland Award for Scholarly Distinction, May 15, 2001, The Club, Birmingham, AL.

214. "Green Polymerization Chemistry: Free Radical Polymerization in Room Temperature Ionic Liquids", J. W. Mays, presentation at the 2001 Annual Chemistry Department Student Awards Reception, May 18, 2001, Birmingham, AL.

215. "New Functional Nanostructured Materials Through Anionic Polymerization", J. W. Mays, Presented to the Department of Chemistry, University of Tennessee, Knoxville, TN, May 24, 2001.

216. "New Functional Nanostructured Materials Through Anionic Polymerization", J. W. Mays, presented at Oak Ridge National Laboratory, May 25, 2001, Oak Ridge, TN.

217. "Controlled Architecture Poly(cyclohexadiene) Polymers and Copolymers", J. W. Mays, presented at the Department of Chemistry, University of Athens, Athens, Greece, June 13, 2001.

218. "New Functional Nanostructured Materials Through Anionic Polymerization", J. W. Mays, presented at CEA – Saclay, Saclay, France, June 20, 2001

219. "Nanocomposite Materials Prepared by Surface Initiated Anionic polymerization initiated from Si-gel and clay nanoparticle surfaces: Homopolymers and Copolymers", Q. Zhou, X. Fan, S. Wang, J. Mays, G. Sakkelariou, S. Hadjichristides, R. Advincula, presented at 222nd Annual Meeting of American Chem. Soc. Chicago, IL, Aug. 26-30, 2001. See Also, *Polymer Preprint, 42*, 59, 2001.

220. "Controlled Preparation of Gold Nanoparticles using Star Block Copolymers", J. Youk, R. Advincula, J. Locklin, M-K. Park, J. Yang, J. Mays, presented at 222nd Annual Meeting of American Chem. Soc. Chicago, IL, Aug. 26-30, 2001. See Also, *Polymer Preprints*, 42 *(2)*, 358, 2001.

221. "Synthesis and Properties of Linear and Branched Polymers and Copolymers Based on 1,3 Cyclohexadine", J. Mays and Kunlun Hong, presented at the IUPAC Symposium on Ionic Polymerization and Related Processes, Heraklion, Crete, Oct. 22-26, 2001.

222. "Surface Initiated Anionic Polymerization: Homopolymers and Block Copolymers", G. Sakellariou, S. Pispas, N. Hadjichristidis, R. Advincula, Q. Zhou, and J.W. Mays, presented at the IUPAC Symposium on Ionic Polymerization and Related Processes, Heraklion, Crete, Oct. 22-26, 2001.

223. "Free Radical Polymerization in Room Temperature Ionic Liquids", K. Hong, H. Zhang, and J.W. Mays, presented at the IUPAC Symposium on Ionic Polymerization and Related Processes, Heraklion, Crete, Oct. 22-26, 2001.

224. "Synthesis of Regular Multigraft Poly(Isoprene-g-Styrene) with Hexafunctional Branch Points, "Barbwires", D. Uhrig, and J.W. Mays, presented at the IUPAC Symposium on Ionic Polymerization and Related Processes, Heraklion, Crete, Oct. 22-26, 2001.

225. "Synthesis of Model Block Copolymers", J. W. Mays, Army Workshop on Perm-Selective Membranes, Aberdeen, MD, November 14-15, 2001.

226. "Anionic Polymerization: Squeezing Something New Out of an Old Technique", J. W. Mays, presented at the Department of Polymer Science and Engineering, Univ. of Massachusetts, Amherst, MA, December 14, 2001.

227. "Nanostructured Soft Materials through Block Copolymer Self-Assembly", J.W. Mays, presented at Battelle Technical Council Meeting Georgia Institute of Technology, Atlanta GA, March 4-6, 2002.

227. "A Block Copolymer Approach to Novel Nanotubes", K. Hong, J.Zhu, S. Gido, T. Russell and J.W. Mays, presented at Battelle Technical Council Meeting Georgia Institute of Technology, Atlanta GA, March 4-6, 2002.

228. "Free Radical Polymerization in Room Temperature Ionic Liquids", H. Zhang, K. Hong, and J. W. Mays, presented at the Robert M. Hearin Support Foundation Symposium honoring Roger Porter, April 4-5, 2002, University of Southern Mississippi, Hattiesburg, MS.

229. "Long Chain Branching in Polymers and Copolymers", J. W. Mays, presented at the Department of Materials Science and Engineering, University of Tennessee, Knoxville, TN, April 11, 2002.

230. "The Utility of Model Polymers in Understanding Structure-Property Relationships for Complex Polymers", J. W. Mays, presented at the International Symposium on Polymer Analysis and Characterization, Twente University, The Netherlands, June 17-19, 2002.

231. "Synthesis and Properties of Ionic/Neutral Block Copolymers of Controlled Architectures", J. C. Yang and J. W. Mays, presented at the International Symposium on Polymer Analysis and Characterization, Twente University, The Netherlands, June 17-19, 2002.

232. "Controlled Synthesis of Nanoparticles Using Block Copolymers: Nanoreactors in Microgravity Conditions", R. C. Advincula, J. P. Claude, and J. W. Mays, presented at the 2002 NASA Microgravity Materials Science Conference, Huntsville, AL, June 25-26, 2002.

233. "Surface and Interfacial Structures Induced by Electrohydrodynamic Instabilities", T. P. Russell, Z. Lin, T. Kerle, D. A. Hoagland, E. Shaffer, U. Steiner, and J. W. Mays, presented at the 2002 NASA Microgravity Materials Science Conference, Huntsville, AL, June 25-26, 2002.

234. "New Branched Polymer Architectures and New Monomers in Anionic Polymerization",

J. W. Mays, presented at Bridgestone/Firestone Research Center, Akron, OH, July 9, 2002.

235. "Polymerization and Copolymerization in Room Temperature Ionic Liquids", J. W. Mays, K. Hong, and H. Zhang, invited presentation at the IUPAC-sponsored International Conference on Polymer Synthesis, Warwick University, England July 29 – August 1, 2002.

236. "Solution Properties of 1,3-Cyclohexadiene Polymers", K. Hong and J. W. Mays, presented at the National American Chemical Society Meeting, Boston, MA, August 18 – 22, 2002. See also Polymer Preprints, 43(2), 1011-1012 (2002).

237. "Controlled Preparation of Gold Nanopolymers Using Well-Defined Star-Block Copolymers and Polyelectrolyte Complexes", R. Advincula, J.H. Youk, J. Locklin, M.K. Park, J. C. Yang, and J. Mays, presented at the National American Chemical Society Meeting, Boston, MA, August 18-22, 2002.

238. "Synthesis of CoS Nanoparticles in Block and Star-Block Copolymer Micelles", A. Narayanaswamy, J. P. Claude, J. C. Yang, and J. W. Mays, presented at the National American Chemical Society Meeting, Boston, MA, August 18-22, 2002.

239. "Ionic Liquids as Environmentally Benign Solvents for Synthesis of PMMA in [bmim][PF6]: Kinetic, Thermal, and Mechanical Analysis", M.B. Benton, J. D. Holbrey, R. D. Rogers, J. W. Mays, and C.S. Brazel, presented at the 2002 Annual Meeting of AIChE, Indianapolis, IN, November 3-8, 2002.

240. "Polymer Modification of Carbon Nanotubes", M. Bratcher, S. McKnight, H. Ji, and J. W. Mays, presented at the Army Science Conference, Orlando, FL, December 2-6, 2002.

241. "A Study in the Dispersion of Carbon Nanotubes", M. Bratcher, B. Gersten, H. Ji, J. Mays, presented at the Army Science Conference, Orlando, FL, December 2-6, 2002.

242. "Polymerization in Room Temperature Ionic Liquids", K. Hong, H. Zhang, and J. Mays, invited poster at the Polymers West Gordon Conference, Ventura, CA, January 5-10, 2003.

243. "Polymerization in Ionic Liquids: A New Alternative Medium for Free Radical Polymerization", J. W. Mays, presented at the University of Akron, Department of Polymer Science, Akron, OH, January 30, 2003.

244. "Tailoring Macromolecular Architecture with Anionic Polymerization: The Need for Rigorous Molecular Characterization", J. W. Mays, presented at the Workshop on Polymer Synthesis for Physicists, American Physical Society Meeting, Austin, TX, March 1-2, 2003.

245. "Morphologies and Tensile Properties Study on Multigraft Copolymers with Tri-, Tetra-, and Hexafunctional Branch Points", R. Weidisch, Y. Zhu, E. Burgaz, S. P. Gido, D. Uhrig, and J. W. Mays, presented at the American Physical Society Meeting, Austin, TX, March 3-7, 2003.

246. "Amino Acid Derivatives for Formulation of Non-HEMA Containing Glass Ionomer Cements", D. Xie, I. Chung, W. Wu, A. D. Puckett, and J. W. Mays, presented at the American Association for Dental Research Meeting, San Antonio, TX, March 12-15, 2003.

247. "Molecular Modeling of Novel Graft Copolymers", B. G. Sumpter, D. W. Noid, and J. W. Mays, presented at the National Meeting of the American Chemical Society, New Orleans, LA, March 23 – 27, 2003; see also PMSE Preprints, 88, 361-62 (2003).

248. "Adsorption Phenomena of Polyelectrolytes, Amphiphilic Block, and Star Copolymers on Surfaces as Investigated by the Quartz Crystal Microbalance Method", M.-K. Park, S. Pispas, N. Hadjichristidis, J. Mays, and R. C. Advincula, presented at the National Meeting of the American Chemical Society, New Orleans, LA, March 23 – 27, 2003; see also PMSE Preprints, 88, 480-81 (2003).

249. "Polymer Brushes by Living Anionic Surface Initiated Polymerization (LASIP): Synthesis, Mechanism, and Block Copolymers", M.-K. Park, G. Sekellariou, S. Pispas, N. Hadjichristidis, J. Mays, and R. Advincula, presented at the National Meeting of the American Chemical Society, New Orleans, LA, March 23 – 27, 2003; see also Polymer Preprints, 44(1), 431-32 (2003).

250. "Characterization of an Insoluble Polyimide Oligomer by Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry", A. P. Gies, W. K. Nonidez, M. Anthamatten, R. C. Cook, and J. W. Mays, presented at the National Meeting of the American Chemical Society, New Orleans, LA, March 23 – 27, 2003; see also, PMSE Preprints, 88, 180 (2003).

251. "Structure and Scaling of Brushes Formed from Branched Polymer Amphiphiles", P. Tian, J. Yang, J. Mays, and S. M. Kilbey, presented at the National Meeting of the American Chemical Society, New Orleans, LA, March 23 – 27, 2003; see also Polymer Preprints, 44(1), 443-44 (2003).

252. "Synthesis and Evaluation of Non-HEMA Containing Glass-Ionomer Cements for Dental Applications", D. Xie, I. Chung, W. Wu, J. Lemons, A. Puckett, and J. Mays, presented at the Society for Biomaterials 29th Annual Meeting, April 30 – May 3, 2003.

253. "Synthesis and Structure-Property Relationships for Model Graft Copolymers", presented at the AVS (American Vacuum Society) Meeting, Knoxville, TN, May 20, 2003.

254. "Synthesis and Structure – Property Relationships of Model Graft Copolymers", J. W. Mays, invited plenary lecture at the Molecular Architecture for Performance (MAP) MURI Workshop (DOD), Aberdeen, MD, May 27 – 28, 2003.

255. "Polymer Structure-Property Relationships", J. W. Mays, presented at the workshop "Advanced Topics on Polymer Characterization", part of the 16th International Symposium on Polymer Analysis and Characterization (joint with Waters International GPC Symposium 2003), Baltimore, MD, June 8-12, 2003.

256. "Model Graft Copolymers", J. W. Mays, presented at Kraton Polymers, Houston, TX, June 18, 2003.

257. "Synthesis and Structure-Property Relationships for Regular Multigraft Copolymers", J. W. Mays, invited talk at the IUPAC-Sponsored International Symposium on Ionic Polymerization, Boston, MA, June 30 – July 4, 2003.

258. "Synthesis of Hyperbranched Polybutadiene through Anionic Self-Condensing Vinyl Polymerization", D. Baskaran and J. W. Mays, presented at the IUPAC-Sponsored International Symposium on Ionic Polymerization, Boston, MA, June 30 – July 4, 2003.

259. "Modification of Multi-Wall Carbon Nanotubes Through Covalent and Noncovalent Reactions of Polymers", D. Baskaran and J. W. Mays, presented at the Army Research Laboratory, Aberdeen, MD, July 15, 2003.

260. "Synthesis and Properties of Poly(isoprene-graft-styrene) Regular Multigrafts", R. Weidisch, S. P. Gido, D. Uhrig, and J. W. Mays, presented at the 26th Annual Australian Polymer Symposium, Noosa, Australia, July 14-16, 2003.

261. "Synthesis and Properties of Homopolymers and Copolymers having Multiple Regularly Spaced Branch Points", J. W. Mays, presented at the Canadian Society for Chemistry Meeting, Ottawa, August 10-14, 2003.

262. "Sulfonation of 1,3-Cyclohexadiene Polymers: A New Synthetic Polyelectrolyte", K. Hong, M. Liu, and J. W. Mays, presented at the New York National Meeting of the American Chemical Society, New York, NY, September 6-11, 2003; see also, Polymer Preprints, 44(2), 657-58 (2003)

263. "Synthesis and Properties of Homopolymers and Copolymers having Regularly Spaced Multiple Branch Points", J. W. Mays, presented at IPF, Dresden, Germany, September 11, 2003.

264. "Solution Properties of Model Branched Polymers", J. W. Mays, plenary lecture at Wyatt Technology Light Scattering Colloquium, Santa Barbara, CA, September, 22, 2003.

265. "Synthesis and Properties of Long Chain Branched Polymers and Copolymers", J. W. Mays, invited seminar presented to the Department of Chemistry, Virginia Tech, October 15, 2003.

266. "Synthesis of Model Star-Branched Polyelectrolytes", W. Holley, K. Hong, and Jimmy W. Mays, poster presentation at the Gordon Research Conference on Colloidal, Macromolecular, and Polyelectrolyte Solutions, Ventura, CA, February 1-6, 2004.

267. "Synthesis and Characterization of Sulfonated 1,3-Cyclohexadiene Polymers", presented at Gordon Research Conference on Colloidal, Macromolecular and Polyelectrolyte Solutions, Ventura, CA Feb.1-6, 2004.

268. "Influence of Molecular Architecture on the Tensile Properties of Multigraft Copolymers", R. Weidisch, R. Lach, Y. Zhu, E. Burgasz, S. Gido, D. Uhrig, J. Mays, and N. Hadjichristidis, presented at the American Physical Society Meeting, Montreal, Canada, March 22 – 26, 2004.

269. "Defect Study on Noncentrosymmetric Lamellar Block Copolymer Blends", S. Chen, S. P. Gido, T. Tsoukatos, A. Avgeropoulos, N. Hadjichristidis, K. Hong, and J. W. Mays, presented at the American Physical Society Meeting, Montreal, Canada, March 22 – 26, 2004.

270. "Statistical Copolymerization of Styrene and Acrylates in 1-Butyl-3-Methylimidazolium Hexafluorophosphate: Reactivity Ratio Calculations", H. Zhang and J. W. Mays, presented at the American Chemical Society Meeting, Anaheim, CA, March 28 – April 1, 2004. See also, Polym. Preprints, 45(1), 331-332 (2004).

271. "A Room Temperature Ionic Liquid Assisted Polymerization of Methyl Methacrylate at Room Temperature", H. Zhang and J. W. Mays, presented at the American Chemical Society Meeting, Anaheim, CA, March 28 – April 1, 2004. See also, Polym. Preprints, 45(1), 329-330 (2004).

272. "Radius of Gyration of Polystyrene Combs and Centipedes in a Theta Solvent", K. Terao, B. S. Farmer, Y. Nakamura, H. Iatrou, K. Hong, and J. W. Mays, presented at the American Chemical Society Meeting, Anaheim, CA, March 28 – April 1, 2004. See also, Polym. Preprints, 45(1), 947 (2004).

273. "Radical Polymerization of Styrene and Methyl Methacrylate in Various Room Temperature Ionic Liquids", H. Zhang, K. Hong, and J. W. Mays, invited plenary presentation at the American Chemical Society Meeting, Anaheim, CA, March 28 – April 1, 2004. See also, Polym. Preprints, 45(1), 313-314 (2004).

274. "An Evaluation of the Synthetic Strategies Producing Well-Defined Carboxyl End-Capped Polystyrene through Anionic Polymerization", H. Ji and J. W. Mays, presented at the American Chemical Society Meeting, Anaheim, CA, March 28 – April 1, 2004.

See also, Polym. Preprints, 45(1), 1103-1104 (2004).

275. "Attempts of Nitroxide Mediated Polymerization in a Room Temperature Ionic Liquid", H. Zhang, K. Hong, J. W. Mays, and C. Hawker, presented at the American Chemical Society Meeting, Anaheim, CA, March 28 – April 1, 2004. See also, Polym. Preprints, 45(1), 325-325 (2004).

276. "Synthesis of Amino Acid Based Block Copolymers Via Atom Transfer Radical Polymerization in Aqueous Media at Room Temperature", I. Chung, P. Britt, and J. Mays, presented at the American Chemical Society Meeting, Anaheim, CA, March 28 – April 1, 2004. See also, Polym. Preprints, 45(1), 1091-1092 (2004).

277. "Polymer Adhesion and Friction: Importance of the Outermost Molecular Groups", N. Maeda, N. Chen, H. Ji, J. W. Mays, M. V. Tirrell, J. Israelachvili, presented at the American Chemical Society Meeting, Anaheim, CA, March 28 – April 1, 2004.

278. "Solution Properties of Regular Comb and Centipede Polystyrenes Under Good Solvent and Theta Solvent Conditions", J. W. Mays, invited talk at the International Workshop on Branched Polymers for Performance, Williamsburg, VA, May 23 -26, 2004.

279. "New Polymers for Fuel Call Applications", M. Simonson, J. Mays, and K. Mauritz, presented at the DOE 2004 Hydrogen Program Review, Philadelphia, PA, May 24 – 26, 2004.

280. "New Model Polyelectrolytes", K. Hong, P. Britt, D. Holley, J. Yang, and J. Mays, presented at CEA-Saclay, Saclay, France, June 4, 2004.

281. "On-line Measurement of Molecular Weight and Radius of Gyration of Polystyrene in a Good Solvent and in a Theta Solvent Measured with a Two-Angle Light Scattering Detector", K. Terao and J. W. Mays, presented at the International Symposium on Polymer Analysis and Characterization, Heidelberg, Germany, June 7-9, 2004.

282. "New Model Polyelectrolytes", K. Hong, P. Britt, D. Holley, J. Yang, and J. Mays, invited presentation at Polyelectrolytes 2004, Amherst, MA, June 14-18, 2004.

283. "New Charged Block Copolymers Based on Poly(cyclohexadiene)", K. Hong, P. Britt, and J. W. Mays, presentation at Polyelectrolytes 2004, Amherst, MA, June 14-18, 2004.

284. "Morphology and Mechanical Properties of Multigraft Copolymers", U. Staudinger, R. Weidisch, S. P Gido, D. Uhrig, J. Mays, H. Iatrou, and N. Hadjichristidis, 40th World Polymer Congress MACRO 2004, Paris, France, July 4 – 9, 2004.

285. "Effect of Molecular Architecture on Ordering Kinetics of AnBn Miktoarm Star Block Copolymers", X. Hu, S. Gido, T. Russell, and J. Mays, presented at the Army Research Laboratory, Aberdeen, MD, July 28, 2004.

286. "Synthesis of Polymer-Grafted Multi-Walled Carbon Nanotubes Using Grafting From and Grafting Onto Strategies", D. Baskaran, J. Mays, M. Bratcher, presented at the Army Research Laboratory, Aberdeen, MD, July 28, 2004.

287. "Effect of Molecular Architecture on Dynamics of Multigraft Copolymers", M. Sun, J. Mijovic, and J. W. Mays, presented at the National American Chemical Society Meeting, Philadelphia, PA, August 22-26, 2004. See also: PMSE Preprints, 91, 1024 (2004).

288. "Synthesis of Amphiphilic Miktoarm Star Copolymer A_2B_2 of Polystyrene and Poly(ethylene oxide)", M. Liu, P. F. Britt, and J. W. Mays, presented at the National American Chemical Society Meeting, Philadelphia, PA, August 22-26, 2004. See also: Polymer Preprints, 45(2), 555 (2004).

289. "Polyelectrolytes Based on Sulfonated 1,3-Cyclohexadiene Block Copolymers", Kunlun Hong, P. F. Britt, and J. W. Mays, presented at the National American Chemical Society Meeting, Philadelphia, PA, August 22-26, 2004. See also: Polymer Preprints, 45(2), 311 (2004).

290. "Macromolecular Complex Systems", J. Mays and P. Britt, presented at the CNMS Workshop on Microscopy, Metrology, and Manipulations for Nanophase Materials Sciences, American Museum of Science and Energy, Oak Ridge, TN, September 15 – 16, 2004.

291. "MALDI-TOF MS Comparison of Nomex and Oligomeric Poly(m-phenylene isophthalamide)", A. P. Gies, W. K. Nonidez, S. T. Ellison, H. Ji, and J. W. Mays, presented at the Southeast Regional Meeting of the American Chemical Society, Research Triangle Park, NC, November 10 – 13, 2004.

292. "Polymers and Copolymers Based on 1,3-Cyclohexadiene", J. W. Mays, K. Hong, P. Britt, T. Huang, invited lecture at the Polymers West Gordon Research Conference, Ventura, CA, January 9-14, 2005.

293. "Universal Calibration of Gel Permeation Chromatography by Means of Hydrodynamic Radius of Complex Polystyrene Architectures", B. S. Farmer, K. Terao, Y. Nakamura, and J. W. Mays, invited poster presentation, Polymers West Gordon Research Conference, Ventura, CA, January 9-14, 2005.

294. "Novel Biodegradable Amino Acid – Containing Anhydride Oligomers for Orthopedic Applications", D. Xie, I.-D. Chung, A. D. Puckett, and J. W. Mays, presented at the National American Chemical Society Meeting, San Diego, CA, March 13 – 17, 2005; See also: Polymeric Materials Science and Engineering, 92, 363 – 364 (2005).

295. "Thermal Characteristics of Poly(1,3-Cyclohexadienes)", K. Hong, T. Huang, P. F. Britt,

M. Pyda, and J. W. Mays, presented at the National American Chemical Society Meeting, San Diego, CA, March 13 – 17, 2005; See also: Polymer Preprints, 46(1), 843 – 844 (2005).

296. "Reactive Modification of Polymer Interfaces: Formation of Loops", M. D. Dadmun, J. K. Rice, J. W. Mays, H. Ji, G. D. Smith, and D. Bedrov, presented at the National American Chemical Society Meeting, San Diego, CA, March 13 – 17, 2005; See also: Polymer Preprints, 46(1), 461 - 462 (2005).

297. "Investigating the Chemistry and Adsorption Behavior of Multiply Bound Polymer Chains (MBPC)", M. Dadmun, J. Mays, M. Kilbey, G. Smith, and R. Advincula, presented at the National American Chemical Society Meeting, San Diego, CA, March 13 – 17, 2005; See also: Polymer Preprints, 46(1), 420 - 421 (2005).

298. "Multiple Loop Formation by Epoxy-Terminated Polystyrene Telechelics on Self-Assembled Monolayers of 11-Mercaptoundecanoic Acid over Gold", R. Mehta, M. Dadmun, H. Ji, and J. W. Mays, presented at the National American Chemical Society Meeting, San Diego, CA, March 13 – 17, 2005; See also: Polymer Preprints, 46(1), 433 - 434 (2005).

299. "Direct Measurement of Attraction Between Identical Polyelectrolyte Brush Layers in the Presence of Multivalent Ions", F. Li, P. Schorr, M. V. Tirrell, and J. Mays, presented at the National American Chemical Society Meeting, San Diego, CA, March 13 – 17, 2005; See also: Polymer Preprints, 46(1), 377 - 378 (2005).

300. "Adsorption of P2VP-dPS-P2VP Triblock Copolymers onto Reactive Monolayers: Toward Multiply Bound Polymer Chains", J. P. Park, D. Patton, M. Liu, J. Mays, M. Dadmun, and R. Advincula, presented at the National American Chemical Society Meeting, San Diego, CA, March 13 – 17, 2005; See also: Polymer Preprints, 46(1), 501 - 502 (2005).

301. "Influence of Charge Density and Backbone Rigidity on the Structure and Properties of Polyelectrolyte Solutions", S. I. Yun, Y. B. Melnichenko, G. D. Wignall, K. Hong, J. Mays, and R. M. Briber, presented at the National Meeting of the American Physical Society, March 21 – 25, 2005, Los Angeles, CA.

302. "The Influence of Chain Rigidity and Degree of Sulfonation on the Morphology of Block Copolymers as Nano Reactor", K. Hong, S. I. Yun, J. Mays, X. Zhang, and R. M. Briber, presented at the National Meeting of the American Physical Society, March 21 – 25, 2005, Los Angeles, CA.

303. "Grafting and Loop Formation of Telechelic Polymers at Interfaces Monitored by Fluorescence Labeling", Z. Huang, H. Ji, J. Mays, and M. Dadmun, presented at the National Meeting of the American Physical Society, March 21 – 25, 2005, Los Angeles, CA.

304. “Formation and Properties of Molecular Loops at Polymer Interfaces”, J. K. Rice, M. Dadmun, B. Farmer, H. Ji, and J. Mays, presented at the National Meeting of the American Physical Society, March 21 – 25, 2005, Los Angeles, CA.

305. “Stability of Core-Shell-Cylinder Structure of Poly(styrene-b-1,3-cyclohexadiene) Diblock Copolymers”, A. Panday, S. Gido, K. Hong, and J. Mays, presented at the National Meeting of the American Physical Society, March 21 – 25, 2005, Los Angeles, CA.

306. “New Polyelectrolytes based on Poly(1,3-Cyclohexadiene)”, J. W. Mays, invited lecture at the Gordon Research Conference on Ion Containing Polymers, May1-6, 2005, Il Ciocco, Italy.

307. "Effect of Macromolecular Architecture on Microphase Separation and Properties of Block Copolymers", J. W. Mays, D. Uhrig, K. Hong, invited lecture at Vanderbilt University, May 16, 2005.

308. “New Materials for Hydrogen Pipelines”, B. Smith, B. Frame, C. Eberle, J. Blencoe, L. Anovitz, T. Armstrong, and J. Mays, poster presentation, U.S. DOE Hydrogen, Fuel Cells & Infrastructure Technologies Program, Annual Program Review Meeting, Arlington, Virginia, May 23-26, 2005.

309. “New Block Copolymers: From Ultrathin Films to Functional Polymer Nanoparticles”, J. W. Mays, presented to Chemical Sciences Division, Oak Ridge National Laboratory, June 9, 2005.

310. “Characterization of Model Branched Polymers in Good and Theta Solvents Using Multi-Detector SEC”, J. Mays, invited presentation at the International Symposium on Polymer Analysis and Characterization, Sheffield, England, June 20 – 22, 2005.

311. “Monitoring the Kinetics of the Reaction of Telechelics at a Soft Interface by Neutron Reflectivity”, J. K. Rice, H. Ji, J. W. Mays, and M. D. Dadmun, presented at the National Meeting of the American Chemical Society, Washington, DC, August 28 – September 1, 2005; see also: Polym. Mater. Sci. Eng., 93, 292 – 293 (2005).

312. “Characterization of Linear Poly(1,3-cyclohexadiene) (PCHD) and Fluorinated PCHD by GPC/Light Scattering”, Q. Zhou, T. Havard, T. Huang, K. Hong, and J. W. Mays, presented at the National Meeting of the American Chemical Society, Analytical Division, Washington, DC, August 28 – September 1, 2005.

313. “Kinetics of Assembly of “Looped” Polymer Brushes at the Solid-Fluid Interface”, J. Alonzo, M. Liu, M. Dadmun, J. W. Mays, and S. M. Kilbey II, presented at the National Meeting of the American Chemical Society, Washington, DC, August 28 – September 1, 2005; see also: Polym. Mater. Sci. Eng., 93, 89 - 90 (2005).

314. "Telechelic Polymer Velcros or Brushes: Synthesis, Characterization, and Adsorption Studies", D. Patton, J. P. Park, M. Liu, J. Mays, M. Dadmun, M. Kilbey, G. Smith, and R.C. Advincula, presented at the National Meeting of the American Chemical Society, Washington, DC, August 28 – September 1, 2005; see also: Polym. Preprints, 46 (2), 122 - 123 (2005).

315. "Synthesis of Primary Amine Terminated Polymers using Living Anionic Polymerization and Characterization of the Polymers using MALDI-TOF Mass Spectrometry", H. Ji, D. Baskaran, and J. W. Mays, presented at the National Meeting of the American Chemical Society, Washington, DC, August 28 – September 1, 2005; see also: Polym. Preprints, 46 (2), 452 - 453 (2005).

316. "Synthesis and Characterization of Ω-Functionalized Multiarm Star-Branched Polyisoprenes and Poly(ethylene – co – propylene) Using Living Anionic Polymerization", B. Farmer and J. W. Mays, presented at the National Meeting of the American Chemical Society, Washington, DC, August 28 – September 1, 2005; see also: Polym. Preprints, 46 (2), 420 - 421 (2005).

317. "POSS Containing Multiblock Copolymers as Models of Well-Defined Organic-Inorganic Hybrid Materials", G. Cardoen, X. Hu, D. Baskaran, J. W. Mays, S. P. Gido, T. P. Russell, and E. B. Coughlin, presented at the National Meeting of the American Chemical Society, Washington, DC, August 28 – September 1, 2005; see also: Polym. Preprints, 46 (2), 783 - 784 (2005).

318. "Living Anionic Polymerization of 4-Vinylbenzocyclobutene", G. Sakellarou, D. Baskaran, and J. W. Mays, presented at the National Meeting of the American Chemical Society, Washington, DC, August 28 – September 1, 2005; see also: Polym. Preprints, 46 (2), 278 - 279 (2005).

319. "Interaction between End-Tethered Polyelectrolyte Brushes in the Presence of Oppositely Charged Surfactant", A. Ishikubo, J. W. Mays, and M. Tirrell, presented at the National Meeting of the American Chemical Society, Washington, DC, August 28 – September 1, 2005; see also: Polym. Preprints, 46 (2), 27 - 28 (2005).

320. "Defects in a Noncentrosymmetric Lamellar Block Copolymer Blend", S. Chen, S. P. Gido, T. Tsoukatos, A. Avgeropoulos, N. Hadjichristidis, K. Hong, and J. W. Mays, presented at the National Meeting of the American Chemical Society, Washington, DC, August 28 – September 1, 2005; see also: Polym. Preprints, 46 (2), 542 (2005).

321. "New Block Copolymers: From Ultrathin Films to Functional Polymer Nanoparticles", J. W. Mays, invited presentation at the Department of Chemical Engineering, University of Woming, September 12, 2005.

322. "Effect of Macromolecular Architecture and Chain Stiffness on Self-Assembly and

Properties of Block Copolymers", J. W. Mays, D. Uhrig, K. Hong, S. Gido, and R. Weidisch, invited presentation at the Department of Chemical Engineering, University of South Florida, September 16, 2005.

323. "Surface Initiated Anionic and Atom Transfer Radical Polymerizations from Multi-Walled Carbon Nanotubes", D. Baskaran, G. Sakellariou, J. W. Mays, and M. Bratcher, presented at the International Symposium on Ionic Polymerization, October 23 – 28, 2005, Goa, India.

324. "Self-Assembly of Sulfonated 1,3-Cyclohexadience Polymers in Solution", K. Hong, J. W. Mays, P. F. Britt, A. Yun, Y. Melnichenko, G. D. Wignall, and M. Muthukumar, presented at the International Chemical Congress of Pacific Basin Societies, "Pacifichem 2005", Honolulu, HI, December 15 – 20, 2005.

325. "Bulk and Solution Properties of Polymers Based on 1,3-Cyclohexadiene", J. W. Mays, K. Hong, G. Wignall, Y. Melnichenko, A. Yun, P. F. Britt, J. M. Simonson, T. Huang, M. Pyda, B. Farmer, S. Gido, X. Wu, K. Terao, and Y. Nakamura, presented at the International Chemical Congress of Pacific Basin Societies, "Pacifichem 2005", Honolulu, HI, December 15 – 20, 2005.

326. "Synthesis and Characterization of Model Star-Branched Polyelectrolytes", D. W. Holley and J. W. Mays, presented at the International Chemical Congress of Pacific Basin Societies, "Pacifichem 2005", Honolulu, HI, December 15 – 20, 2005.

327. "Superelastic Properties of Multigraft Copolymers", R. Weidisch, U. Staudinger, S. P. Gido, D. Uhrig, J. Mays, and N. Hadjichristidis, presented at the International Chemical Congress of Pacific Basin Societies, "Pacifichem 2005", Honolulu, HI, December 15 – 20, 2005.

328. "Noncentrosymmetric Block Copolymer Blends", S. Chen, S. P. Gido, T. Tsoukatos, A. Avgeropoulos, N. Hadjichristidis, K. Hong, and J. W. Mays, presented at the International Chemical Congress of Pacific Basin Societies, "Pacifichem 2005", Honolulu, HI, December 15 – 20, 2005.

329. "Using Long Chain Branching and Chain Stiffness to Manipulate the Morphology and Properties of Block Copolymers", J. W. Mays, invited presentation at Georgia Institute of Technology, Department of Polymers, Fiber, and Textiles Engineering, February 13, 2006.

330. "Proton Conducting Membranes from Fluorinated Polyisoprene-b- Polystyrene Sulfonate", A.I. Isaacs-Sodeye, S. P. Gido, T. Huang, and J.W. Mays, presented at the American Physical Society Meeting, Baltimore, MD, March 13-17, 2006.

331. "Morphology of Fluorinated and Sulfonated Diblock Copolymers", T. Hosoda, S. P. Gido, T. Huang, and J. W. Mays, presented at the American Physical Society Meeting,

Baltimore, MD, March 13-17, 2006.

332. "Behavior of Cationic Surfactants in Oppositely Charged Polyelectrolyte Brushes formed by Physisorption of Amphiphilic Diblock Copolymers", A. Ishikubo, J. W. Mays, and M. Tirrell, presented at the National Meeting of the American Chemical Society, Atlanta, GA, March 26 – 30, 2006.

333. "Synthesis and Morphology of Fluorinated and Sulfonated Block Copolymers", J. W. Mays, T. Huang, and S. P. Gido, presented at the National Meeting of the American Chemical Society, Atlanta, GA, March 26 – 30, 2006; see also: Polym. Mater. Sci. Eng., 94, 165-166 (2006).

334. "Self-Assembly of Poly(2-vinylpyridine) – Polystyrene – Poly(2-vinylpyridine) Triblock Copolymers at the Solid – Fluid Interface", J. Alonzo, Z. Huang, M. Liu, J. W. Mays, M. Dadmun, and S. M. Kilbey II, presented at the National Meeting of the American Chemical Society, Atlanta, GA, March 26 – 30, 2006; see also: Polym. Mater. Sci. Eng., 94, 703 - 704 (2006).

335. "Distribution of Divalent and Monovalent Counterions within a Charged Brush", P. Guenoun, M. Delsanti, P. Fontaine, and J. W. Mays, presented at the National Meeting of the American Chemical Society, Atlanta, GA, March 26 – 30, 2006; see also: Polym. Mater. Sci. Eng., 94, 629 - 630 (2006).

336. "Density Profiles of "Looped" Polymer Brushes at the Solid – Liquid Interface by Neutron Reflectivity Measurements", Z. Huang, J. Alonzo, M. Lay, M. Liu, H. Ji, Y. Zhang, Y. Fang, G. D. Smith, J. W. Mays, S. M. Kilbey II, and M. D. Dadmun, presented at the National Meeting of the American Chemical Society, Atlanta, GA, March 26 – 30, 2006; see also: Polym. Mater. Sci. Eng., 94, 802 - 803 (2006).

337. "Multiple Loop Formation by Epoxy-Terminated Polystyrene Telechelics on Self-Assembled Monolayers of 11-Mercaptoundecanoic Acid Over Gold", R. Mehta, N. Henry, M. Dadmun, S. M. Kilbey II, H. Ji, and J. Mays, presented at the National Meeting of the American Chemical Society, Atlanta, GA, March 26 – 30, 2006; see also: Polym. Preprints, 47(1), 183 - 184 (2006).

338. "Adsorption of Bifunctionalized Poly(2-Vinylpyridine) – Polystyrene – Poly(2-Vinylpyridine): Characterization by AFM", J. Y. Park, D. Patton, M. Liu, P. Taranekar, J. Mays, M. Dadmun, and R. Advincula, presented at the National Meeting of the American Chemical Society, Atlanta, GA, March 26 – 30, 2006; see also: Polym. Preprints, 47(1), 57 - 58 (2006).

339. "Synthesis, Morphology, and Properties of Novel Branched Block Copolymers", J. W. Mays, S. Gido, and R. Weidisch, invited presentation at CIQA National Research Center, Saltillo, Mexico, April 4, 2006.

340. "Effect of Copolymer Architecture on the Morphology and Properties of Styrene/Isoprene Block Copolymers", J. W. Mays, S. Gido, and R. Weidisch, invited presentation at the American Chemical Society Rubber Division Thermoplastic Elastomers Conference, Akron, Ohio, May 11-12, 2006.

341. "Poly(cyclohexadiene) – Based Polymer Electrolyte Membranes for Fuel Cell Applications", J. W. Mays, T. Huang, H. Zhou, and K. Mauritz, poster presentation at the 2006 DOE Hydrogen Program Review, Washington, DC, May 16 – 19, 2006.

342. "Poly(cyclohexadiene) – Based Polymer Electrolyte Membranes for Fuel Cell Applications", J. W. Mays, T. Huang, H. Zhou, and K. Mauritz, oral presentation at the High Temperature Membranes Working Group, DOE Hydrogen Program Review, Washington, DC, May 16 – 19, 2006.

343. "Vesicle-Forming Block Copolypeptides", H. Iatrou, N. Ferderigos, N. Hadjichristidis, H. Frielinghaus, D. Richter, J. Messman, J. W. Mays, S. Nevanpaa, and O. Ikkalla, invited presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

344. "Synthesis and Characterization of POSS Containing Star Polymers", B. Farmer, C. Barnes, and J. W. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

345. "Grafting and Loop Formation of Telechelic Polymers on Polymer-Substrate Interfaces", Z. Huang, H. Ji, J. W. Mays, and M. D. Dadmun, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

346. "Synthesis and Characterization of Star-Branched Polyelectrolytes", D. W. Holley and J. W. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

347. "Capabilities of the Polymer Characterization Lab", T. Malmgren, E. Ashcraft, M. Dadmun, and J. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

348. "Thermal Stability of Fluorinated Polydienes Synthesized by Addition of Difluorocarbenes", T. Huang, T. Malmgren, K. Hong, and J. W. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

349. "Grafting of Poly(ethylene oxide) Chains onto C60", R. Aggarwal and J. W. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and

Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

350. "Synthesis of Well-Defined Organic Nanoparticles", G. Sakellariou, D. Baskaran, N. Hadjichristidis, and J. W. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

351. "Living Anionic Surface Initiated Polymerization from Multi-Walled Carbon Nanotubes", G. Sakellariou, H. Ji, D. Baskaran, N. Hadjichristidis, and J. W. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

352. "Synthesis of Block Copolymers of Styrene and Vinyl Acetate by Conventional Free Radical Polymerization in a Room Temperature Ionic Liquid", X. Ma, T. Huang, and J. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

353. "MALDI-TOF MS Characterization of Mono-fluorescent Labeled and Primary Amine End-Functionalized Polyisoprene Synthesized by Living Anionic Polymerization", H. Ji, R. Advincula, M. Kilbey, G. Smith, M. Dadmun, and J. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

354. "Synthesis and Characterization of Amphiphilic μ-star PS_2PEO_2 using Alkyllithium Initiator and Phosphazine Base t-BuP4", M. Liu and J. W. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

355. "Synthesis and Characterization of Y-Shaped Branched Copolymer (PS-b-PI)PI_2", M. Liu and J. W. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

356. "Synthesis, Morphology, and Tensile Properties of Multigraft Copolymers with Regularly Spaced Tri-, Tetra-, and Hexa-functional Junction Points", D. Uhrig, J. W. Mays, Y. Zhu, E. Burgaz, S. P. Gido, U. Staudinger, and R. Weidisch, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

357. "Synthesis of Well-Defined Oligo(oxyethylene) Styrene Block Copolymers and their Temperature-Induced Phase Transitions in Aqueous Solution", F. Hua, K. Hong, P. F. Britt, and J. W. Mays, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

358. "Characterization of Sulfonated 1,3-Cyclohexadiene Polymers by Light Scattering and

Small-Angle Neutron Scattering (SANS)", K. Hong, S. I. Yun, J. W. Mays, Y. B. Melnichenko, and G. D. Wignall, poster presentation at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC), Oak Ridge, Tennessee, June 12 – 14, 2006.

359. "Synthesis and Characterization of Poly(L-Aspartic Acid) – Based Chimeras using High Vacuum Techniques", J. M. Messman, P. F. Britt, J. W. Mays, and P. Guenoun, presented at the National Meeting of the American Chemical Society, San Francisco, CA, September 10 – 14, 2006; see also Polym. Preprints, 47(2), 172-173 (2006).

360. "Self-Assembly of Sulfonated Poly(1,3-Cyclohexadiene) in Aqueous Solution as Studied by Small-Angle Neutron Scattering (SANS)", S. H. Yun, K. Hong, Y. B. Melnichenko, G. D. Wignall, and J. W. Mays, presented at the National Meeting of the American Chemical Society, San Francisco, CA, September 10 – 14, 2006; see also Polym. Preprints, 47(2), 620 - 621 (2006).

361. "Synthesis and Properties of Fluorinated and Sulfonated Block Copolymers", J. W. Mays, invited lecture presented at the University of Akron, Akron, OH, October 6, 2006.

362. "New Block Copolymers Containing Sulfonated Blocks", J. W. Mays, invited lecture at Fudan University, Shanghai, China, October 24, 2006.

363. "Effect of Architecture on Morphology and Mechanical Properties of Block Copolymers: Routes to Super-Elastomers", J. W. Mays, invited lecture at Fudan University, Shanghai, China, October 24, 2006.

364. "Effect of Architecture on Morphology and Mechanical Properties of Block Copolymers: Routes to Super-Elastomers", J. W. Mays, invited lecture at East China University of Science and Technology, Shanghai, China, October 25, 2006.

365. "Fluorinated and Sulfonated Poly(1,3-Cyclohexdiene-*b*-Polystyrene: A Potential Material for Fuel Cell PEM", T. Huang and J. W. Mays, invited presentation at the Polymers West Graduate Research Seminar, Ventura, CA, January 5 – 7, 2007.

366. "Poly(Cyclohexadiene)-Based Polymer Electrolyte Membranes for Fuel Cell Applications", S. Deng, M. K. Hassan, K. A. Mauritz, and J. W. Mays, invited poster presentation at the Polymers West Gordon Research Conference, Ventura, CA, January 7 – 12, 2007.

367. "Tailored Amino Acid Based Block Copolymers via Atom Transfer Radical Polymerization in Aqueous Media at Ambient Temperature", I. Chung, P. Britt, and J. W. Mays, invited poster presentation at the Polymers West Gordon Research Conference, Ventura, CA, January 7 – 12, 2007.

368. "Vinyl Dimethyl Azlactone-Containing Copolymers: Toward Bio-inspired Surfaces", J.

Messman, M. Kilbey, J. Ankner, D. Myles, and J. Mays, invited poster presentation at the Polymers West Gordon Research Conference, Ventura, CA, January 7 – 12, 2007.

369. "Fluorinated and Sulfonated Poly(1,3-Cyclohexdiene-*b*-Polystyrene: A Potential Material for Fuel Cell PEM", T. Huang and J. W. Mays, invited poster presentation at the Polymers West Gordon Research Conference, Ventura, CA, January 7 – 12, 2007.

370. "Synthesis, Self-Assembly, and Biofunctionalization of Stimuli-Responsive Polymer Brushes", J. M. Messman, A. Banaszek, J. Barringer, and S, M. Kilbey II, presented at the 34th International Waterborne, High-Solids, and Powder Coatings Symposium, New Orleans, LA, February 14 – 16, 2007; see also Proceedings of the 34th International Waterborne, High-Solids, and Powder Coatings Symposium, 67 – 76 (2007).

371. "Proton Conducting Membranes from Fluorinated Poly(isoprene)-b-Sulfonated Poly(styrene): Structure and Transport Properties", A. Isaacs-Sodeye, S. Gido. T. Huang, and J. Mays, presented at the 2007 March Meeting of the American Physical Society, Denver, Colorado, March 5-9, 2007.

372. "Grafting of Telechelic Polymers onto Functionalized Substrates in Polymeric Matrices", R. Mehta, Z. Huang, H. Ji, J. Mays, M. D. Dadmun, presented at the 2007 March Meeting of the American Physical Society, Denver, Colorado, March 5-9, 2007.

373. "Kinetics of Grafting and Loop Formation of Telechelic Polymers on a Solid Substrate", M. Dadmun, Z. Huang, H. Ji, and J. Mays, presented at the 2007 March Meeting of the American Physical Society, Denver, Colorado, March 5-9, 2007.

374. "Superelastic Materials based on Mutigraft Copolymers", U. Staudinger, R. Weidisch, Y. Zhu, S. P. Gido, D. Uhrig, J. W. Mays, M. Kleuppel, and G. Heinrich, presented at the 2007 March Meeting of the American Physical Society, Denver, Colorado, March 5-9, 2007.

375. "Small-angle Neutron Scattering Study of Oligo(ethylene glycol) Grafted Polystyrene in Aqueous Solutions", G. Cheng, Y. B. Melnichenko, , G. D. Wignall, F. Hua, K. Hong, P. F. Britt, and J. W. Mays, presented at the 2007 March Meeting of the American Physical Society, Denver, Colorado, March 5-9, 2007.

376. "Synthesis of Dual-Responsive Diblock Copolymers of Poly(acrylic acid) and Poly(oligo(oxyethylene)styrene) and their Self-Assembly in Water", F. Hua, K. Hong, P. F. Britt, and J. W. Mays, presented at the Spring 2007 National Meeting of the American Chemical Society, Chicago, IL, March 25 – 29, 2007; see also Polym. Mater. Sci. Eng., 96, 361 – 362 (2007).

377. "Structure and Scaling Behavior of Polymer Brushes with Multiple Tethers", J. Alonzo, Z. Huang, H. Ji, J. W. Mays, M. Dadmun, and S. M. Kilbey II, presented at the Spring 2007 National Meeting of the American Chemical Society, Chicago, IL, March 25 – 29,

2007; see also Polym. Preprints, 48(1), 781-82 (2007).

378. "Phase Transitions of Well-Defined Methoxyoligo(oxyethylene)styrene Block Copolymers in Concentrated Aqueous Solutions", F. Hua, K. Hong, P. F. Britt, and J. W. Mays, presented at the Spring 2007 National Meeting of the American Chemical Society, Chicago, IL, March 25 – 29, 2007; see also, Polym. Preprint, 48(1), 838-39 (2007).

379. "Monitoring the Reaction of Telechelics at a Soft Polymeric Interface to Form Interfacial Modifiers", M. D. Dadmun, J. K. Rice, H. Ji, J. W. Mays, V. Krikorian, E. L. Thomas, G. D. Smith, and D. Bedrov, presented at the Spring 2007 National Meeting of the American Chemical Society, Chicago, IL, March 25 – 29, 2007; see also, Polym. Preprints, 48(1), 731-32 (2007).

380. "Looped Polymer Brushes at the Solid-Fluid Interface Formed by Preferential Adsorption of Amphiphilic Star Block Copolymers", J. Alonzo, H. Ji, J. W. Mays, M. Dadmun, and S. M. Kilbey II, presented at the Spring 2007 National Meeting of the American Chemical Society, Chicago, IL, March 25 – 29, 2007; see also, Polym. Preprints, 48(1), 721-22 (2007).

381. "New Polymeric Materials Derived from 1,3-Cyclohexadiene", J. Mays, invited lecture at the Symposium on Functional Polymer Based Materials, Jena, Germany, April 3-4, 2007.

382. "Superelastic Materials Based on Multigraft Copolymers", R. Weidisch, U. Staudinger, Y. Zhu, S. P. Gido, D. Uhrig, J. W. Mays, H. Iatrou, and N. Hadjichristidis, invited presentation at the Symposium on Functional Polymer Based Materials, Jena, Germany, April 3-4, 2007.

383. "Influence of Branch Points in Tetrafunctional PI-PS Multigraft Copolymers on Mechanical and Rheological Properties", M. Thunga, U. Staudinger, R. Weidisch, D. Uhrig, J. W. Mays, and S. P. Gido, invited presentation at the Symposium on Functional Polymer Based Materials, Jena, Germany, April 3-4, 2007.

384. "Control of Molecular Architecture in Block Copolymers: Routes to Super-Elastomers", J. W. Mays, invited presentation at the University of Southern Mississippi, Hattiesburg, MS, April 11, 2007.

385. "Poly(cyclohexadiene)–Based Polymer Electrolyte Membranes for Fuel Cell Applications", J. Mays, S. Deng, M. Hassan, and K. Mauritz, presented at the 2007 DOE Hydrogen Program Annual Merit Review, Arlington, VA, May 14 – 17, 2007.

386. "Synthetic Methods to Modify Surfaces with Polymers", J. W. Mays, invited presentation at the 2007 American Chemical Society National Graduate Polymer Research Conference, Knoxville, TN, June 3-6, 2007.

387. "Light Scattering Study of Well-Defined Flexible Polyelectrolytes with Two Cationic Sites per Monomeric Unit", M. Osa, G. Mounttrichas, K. Hong, S. Pispas, P. F. Britt, and J. W. Mays, presented at the Fall 2007 National Meeting of the American Chemical Society, Boston, MA, August 19 – 23, 2007. See also: Polym. Mater. Sci. Eng., 97, 930 (2007).

388. "Characterization of Branched and End-Functionalized Polymers", J. W. Mays, invited presentation at Chevron Oronite Company, Richmond, CA, September 10, 2007.

389. "Synthesis and Characterization of Poly(Cyclohexadiene)-Based Fuel Cell Membranes", S. Deng, M. Hassan, K. Mauritz, and J. Mays, presented at the 20th International Symposium on Polymer Analysis and Characterization, October 1-4, 2007, Agios Nikolaos, Crete, Greece.

390. "Characterization of Vesicular Structures Formed by Amphiphilic Well Defined Triblock Copolypeptides", H. Iatrou, H. Frielinghaus, S. Hanski, N. Ferdirigos, J. Ruokolainen, O. Ikkala, D. Richter, J. Mays, and N. Hadjichristidis, presented at the 20th International Symposium on Polymer Analysis and Characterization, October 1-4, 2007, Agios Nikolaos, Crete, Greece.

391. "Synthesis and Characterization of Well Defined Polymer-Grafted Multi-Walled Carbon Nanotube Composites by Living Anionic, Atom Transfer, and Ring Opening Surface Initiated Polymerization", D. Priftis, G. Sakellariou, J. Mays, and N. Hadjichristidis, presented at the 20th International Symposium on Polymer Analysis and Characterization, October 1-4, 2007, Agios Nikolaos, Crete, Greece.

392. "Deuteration Capabilities – Making Labelled Nanomaterials for Neutron Studies", J. Mays et al., CNMS Users Meeting, October 10 – 11, 2007, Oak Ridge, TN.

393. "Energy-Related Soft Materials: Conducting and Liquid Crystal Polymers", J. Mays et al., CNMS Users Meeting, October 10 – 11, 2007, Oak Ridge, TN.

394. "Synthesis of Bio-Inspired Nanomaterials", J. Mays et al., CNMS Users Meeting, October 10 – 11, 2007, Oak Ridge, TN.

395. "Poly(1,3-Cyclohexadiene)-Based Proton Exchange Fuel Cell Membranes", S. Deng, M. K. Hassan, J. W. Mays, and K. A. Mauritz, invited presentation at the Southeast Regional Meeting of the American Chemical Society (SERMACS), October 26, 2007, Greenville, SC.

396. "Synthesis, Morphology, and Properties of Branched or Charged Block Copolymers", J. W. Mays, invited lecture at the Second International Symposium on Polymer Materials Science, National Institute of Standards and Technology, Gaithersburg, MD, December 10 – 11, 2007.

397. "Novel Ion-Containing Polymers Via Post-Polymerization Chemistry" J. Mays, invited Highlands in Chemistry Lecture at the Department of Chemistry, Virginia Tech, Blacksburg, VA, March 14, 2008.

398. "Poly(cyclohexadiene)-Based Polymer Electrolyte Membranes for Fuel Cell Applications", J. Mays, S. Deng, M. Hassan, and K. Mauritz, presented to the meeting of the FreedomCar and Fuel Cells Partnership, Detroit, MI, March 19, 2008.

399. "Surface Modification of Multi-Walled Carbon Nanotubes by Living Anionic and Ring Opening Surface Initiated Polymerization", G. Sakellariou, D. Priftis, H. Iatrou, D. Baskaran, J. W. Mays, and N. Hadjichristidis, presented at the National Meeting of the American Chemical Society, New Orleans, LA, April 6-10, 2008; see also: Polym. Mater. Sci. Eng., 98, 207-209 (2008).

400. "Solution Properties and Adsorbed Morphology of Polystyrene – Polyisoprene Miktoarm, Copolymers", J. P. Hinestrosa, J. Alonzo, M. Liu, M. Osa, J. Mays, and S. M. Kilbey II, presented at the National Meeting of the American Chemical Society, New Orleans, LA, April 6-10, 2008; see also: Polym. Mater. Sci. Eng., 98, 476 - 477 (2008).

401. "Kinetics of Self Assembly of Star Block Copolymers that Tether by their Corona Blocks at the Solid-Fluid Interface", J. Alonzo, H. Ji, J. P. Hinestrosa, J. W. Mays, M. Dadmun, and S. M. Kilbey II, presented at the National Meeting of the American Chemical Society, New Orleans, LA, April 6-10, 2008; see also: Polym. Mater. Sci. Eng., 98, 38 - 39 (2008).

402. "Kinetics of Adsorption of Polystyrene-Polyisoprene Miktoarm Copolymers", J. P. Hinestrosa, J. Alonzo, M. Liu, M. Osa, J. Mays, and S. M. Kilbey II, presented at the National Meeting of the American Chemical Society, New Orleans, LA, April 6-10, 2008; see also: Polym. Mater. Sci. Eng., 98, 34 - 35 (2008).

403. "Equilibrium Structure of Polymer Brushes with Multiple Tethers by Self assembly of Star Block Copolymers at the Solid-Fluid Interface, J. Alonzo, J. P. Hinestrosa, J. W. Mays, M. Dadmun, and S. M. Kilbey II, presented at the National Meeting of the American Chemical Society, New Orleans, LA, April 6-10, 2008; see also: Polym. Mater. Sci. Eng., 98, 365 - 366 (2008).

404. "Compatibilization of Polymer Blends by Multiblock Copolymers Formed In-Situ via Melt Mixing", E. Ashcraft, H. Ji, J. Mays, and M. Dadmun, presented at the National Meeting of the American Chemical Society, New Orleans, LA, April 6-10, 2008; see also: Polym. Mater. Sci. Eng., 98, 139 - 140 (2008).

405. "Controlled Functional Nanoparticles from Diblock Copolymer Micelles", G. Sakellariou, E. Driva, D. Baskaran, and J. W. Mays, presented at the National Meeting of the American Chemical Society, New Orleans, LA, April 6-10, 2008; see also: Polym.

Preprints, 49(1), 315 - 316 (2008).

406. "Conformation of Water Soluble Polythiophenes in Aqueous Solution", R. Verduzco, K. Hong, J. W. Mays, and P. F. Britt, presented at the National Meeting of the American Chemical Society, New Orleans, LA, April 6-10, 2008; see also: Polym. Preprints, 49(1), 313 - 314 (2008).

407. "Novel Proton Conductive Membranes Derived from 1,3-Cyclohexadiene", J. Mays, S. Deng, M. Hassan, and K. Mauritz, invited Keynote Lecture at the Purdue University Hydrogen Symposium 2008, West Lafayette, IN, April 24 – 25, 2008.

408. "Poly(cyclohexadiene)-Based Polymer Electrolyte Membranes for Fuel Cell Applications", J. Mays, S. Deng, M. Hassan, and K. Mauritz, presented at the DOE Annual Hydrogen Review, Arlington, VA, June 9 – 11, 2008.

409. "Effect of Molecular Structure on Rheological Behavior of Nearly Monodisperse H-Shaped Polybutadienes", S.W. Li, H.E. Park, J.M. Dealy, M. Maric, M.S. Rahman, J. Mays, X. Chen, R.G. Larson, Invited Presentation at the XVth International Congress on Rheology, August 3-8, 2008, Monterey, CA; see also Proceedings of the XVth International Congress on Rheology, 1027:430-432 (2008).

410. "Synthesis of Fluorine-Containing Polymer by Living Radical Polymerization", L. He, K. Hong, P. F. Britt, J. Mays, and D. G. Bucknall, presented at the National Meeting of the American Chemical Society, August 17 - 21, 2008, Philadelphia, PA; see also Polymer Preprints, 49(2), 319 – 320 (2008).

411. "Micellization of Block Copolymers in Subcritical and Supercritical Solvents", M. Radosz, Z. Tyrrell, W. Winoto, S. Tan, Y. Shen, K. Hong, and J. Mays, presented at the National Meeting of the American Chemical Society, August 17 - 21, 2008, Philadelphia, PA.

412. "Novel Proton Conductive Membranes based on Poly(Cyclohexadiene) Derivatives", J. W. Mays, invited lecture at the UK Polymer Showcase, September 16 – 18, 2008, York, England.

413. "Film Casting Behavior of Well-Characterized Polyethylenes with Different Branching Structure", D. Auhl, S. Kunamaneni, J. Embery, C. W. Seay, C. D. McGrady, T. Malmgren, J. W. Mays, D. G. Baird, T.C.B. McLeish, presented at the UK Polymer Showcase, September 16 – 18, 2008, York, England.

414. "Polymer Based Nanotechnology for Protection", J. W. Mays, presented at North Carolina State University, September 22, 2008, Raleigh, North Carolina.

415. "Novel Ion-Containing Polymers Via Post-Polymerization Chemistry: Synthesis, Morphology, and Mineralization Studies", J. W. Mays, invited lecture at the 7th Hellenic

Polymer Conference, September 28 – October 1, 2008, Ioannina, Greece.

416. "Vesicles from Well-Defined Block Copolypeptides", H. Iatrou, F. Federigos, N. Hadjichristidis, H. Frielinghaus, D. Richter, S. Nevanpaa, O. Ikkala, and J. W. Mays, invited lecture at the 7th Hellenic Polymer Conference, September 28 – October 1, 2008, Ioannina, Greece.

417. "A General Approach to Surface Initiated Polymerization from Multi-Wall Carbon Nanotubes", D. Priftis, G. Sakellariou, D. Baskaran, J. W. Mays, and N. Hadjichristidis, invited lecture at the 7th Hellenic Polymer Conference, September 28 – October 1, 2008, Ioannina, Greece.

418. "Synthesis, Molecular and Morphological Characterization of Linear Triblock Terpolymers Where One of the Blocks is Poly(Cyclohexadiene)", K. Misichronis, S. Rangou, E. Ashcroft, J. W. Mays, and A. Avgeropoulos, poster at the 7th Hellenic Polymer Conference, September 28 – October 1, 2008, Ioannina, Greece.

419. "Controlled Functional Nanoparticles", E. Driva, G. Sakellariou, D. Baskaran, and J. W. Mays, poster at the 7th Hellenic Polymer Conference, September 28 – October 1, 2008, Ioannina, Greece.

420. "A New Approach to Click Chemistry - Combination of Anionic Polymerization and Click Chemistry", A. Touris, J. Mays, N. Hadjichristidis, 7th Hellenic conference on Polymers, Giannina, Greece, 28 September - 1 October, 2008.

421. "Synthesis, Morphology and Properties of Branched Block Copolymers", J. W. Mays, invited presentation at the University of the South, Sewanee, TN, November 7, 2008.

422. "Sulfonated Fuel Cell Membrane", J. Mays, S. Deng, K. Mauritz, M. Hassan, presented at the Tennessee Innovation Conference, Nashville, TN, November 20 – 21, 2008.

423. "Novel Charged Polymers: From Biomineralization to Fuel Cell Membranes", J. W. Mays, invited lecture at the University of Minnesota, Department of Chemical Engineering and Materials Science, December 2, 2008.

424. "Evaluation of the Final Morphology of HIPS Based on the Architecture of the Compatibilizer Graft Copolymer PBd-g-PS", C. de Anda, G. Morales, P. Acuna, J. Sosa, D. Knoeppel, and J. Mays, presented at the Inaugural Mexican-American Conference on Advances in Polymer Science, Los Cabos, Mexico, December 7-10, 2008.

425. "Poly(cyclohexadiene)-Based Polymer Electrolyte Membranes for Fuel Cell Applications", J. Mays, S. Deng, M. Hassan, and K. Mauritz, presented at US Car, Detroit, MI, February 11, 2009.

426. "Poly(cyclohexadiene)-Based Polymer Electrolyte Membranes for Fuel Cell

Applications", J. Mays, S. Deng, M. Hassan, and K. Mauritz, presented to Department of Energy, Washington, DC, February 26, 2009.

427. "Determining the Effectiveness of Polymer Blend Compatibilization by Multiblock Copolymers formed in-situ via Melt Blending", E. Ashcraft, H. Ji, J. W. Mays, and M. D. Dadmun, presented at the Spring 2009 National ACS Meeting, Salt Lake City, UT, March 22 – 26, 2009; see also: Polymeric Materials: Science & Engineering, 100, 229 – 230 (2009).

428. "Novel Thermally Switchable Smart Polymer Films", S. Zhang, D. Bucknall, K. Hong, L. He, and J. Mays, presented at the Spring 2009 National ACS Meeting, Salt Lake City, UT, March 22 – 26, 2009; see also: Polymeric Materials: Science & Engineering, 100, 172 (2009).

429. "Synthesis of Controlled Functional Nanoparticles", P. Driva, G. Sakellariou, D. Baskaran, V. Urban, and J. W. Mays, presented at the Spring 2009 National ACS Meeting, Salt Lake City, UT, March 22 – 26, 2009; see also: Polymer Preprints, 50(1), 124 - 125 (2009).

430. "Synthesis and Characterization of Primary Amine ώ-Functionalized Polystyrene", J. M. Messman, D. L. Pickel, D. W. Uhrig, and J. W. Mays, presented at the Spring 2009 National ACS Meeting, Salt Lake City, UT, March 22 – 26, 2009; see also: Polymer Preprints, 50(1), 141 - 142 (2009).

431. "Modeling of Hysteresis Behavior of Multigraft Copolymers", R. Schlegel, D. Wilkin, U. Staudinger, R. Weidisch, J. W. Mays, D. Uhrig, and N. Hadjichristidis, presented at the DPG Spring Meeting, Dresden, Germany, March, 22 – 27, 2009.

432. "Synthesis, Morphology and Properties of Branched Block Copolymers", J. W. Mays, invited Bayer Lectures on Polymers, Cornell University, Ithaca New York, April 8, 2009.

433. "Novel Charged Polymers: From Biomineralization to Fuel Cell Membranes", J. W. Mays, invited Bayer Lectures on Polymers, Cornell University, Ithaca New York, April 9, 2009.

434. "Poly(cyclohexadiene)-Based Polymer Electrolyte Membranes for Fuel Cell Applications", J. Mays, S. Deng, M. Hassan, and K. Mauritz, presented at the DOE Annual Hydrogen Review, Arlington, VA, May 18 – 21, 2009.

435. "Neutron Scattering Research Network for EPSCoR States", T. Egami, J. Mays, J. Smith, presented at the 2009 DOE EPSCoR Review, Hauppauge, New York, July 20-23, 2009.

436. "Assembly and Characterization of Well Defined Poly(P-Phenylene) Polymer Brushes

for Advanced Energy Systems", J. Alonzo, X. Yu, K. Hong, S. Deng, O. Swader, M. Dadmun, J. Ankner, P. Britt, J. Mays, and S.M. Kilbey II, presented at the Fall 2009 National Meeting of the American Chemical Society, Washington, DC, August 16 – 20, 2009. See also, PMSE Preprints, 101, 1594 – 1595 (2009).

437. "Synthesis and Characterization of Comb-Like Copolymers with Thiophene Backbone", X. Yu, Y. Li, J. W. Mays, and K. Hong, presented at the Fall 2009 National Meeting of the American Chemical Society, Washington, DC, August 16 – 20, 2009. See also, PMSE Preprints, 101, 1537 – 1539 (2009).

438. "Synthesis and Solution Properties of Poly(9-Phenyl-10-(4-Vinylphenyl) Anthracene)", Y. Li, G. Cheng, X. Yu, Y. B. Melnichenko, J. W. Mays, and K. Hong, presented at the Fall 2009 National Meeting of the American Chemical Society, Washington, DC, August 16 – 20, 2009. See also, PMSE Preprints, 101, 909 - 910 (2009).

439. "Synthesis of Fluorine-Containing ABC Linear Triblock Copolymer by Controlled Radical Polymeriztion and Self-Assembly in Solution", L. He, K. Hong, S. M. Kilbey II, J. W. Mays, S. Zhang, and D. G. Bucknall, presented at the Fall 2009 National Meeting of the American Chemical Society, Washington, DC, August 16 – 20, 2009. See also, PMSE Preprints, 101, 1596 - 1597 (2009).

440. "Functional Polymer Architecture Research at the Center for Nanophase Materials Sciences", J. Mays, invited lecture at the Fall 2009 National Meeting of the American Chemical Society, Washington, DC, August 16 – 20, 2009.

441. "Low Cost High Temperature Fuel Cell Membrane Based on Poly(1,3-cyclohexadiene) Homopolymers, Polymer Blends, and Block Copolymers", S. Deng, J. W. Mays, M. K. Hassan, and K. A. Mauritz, presented at the Fall 2009 National Meeting of the American Chemical Society, Washington, DC, August 16 – 20, 2009.

442. "Efffect of the Molecular Parameters of the Graft Copolymer PBd-g-PS in the Morphological Development of the Rubber Phase in HIPS", C. de Anda, G. Morales, J. Sosa, D. Knoeppel, and J. W. Mays, presented at the Fall 2009 National Meeting of the American Chemical Society, Washington, DC, August 16 – 20, 2009. See also, Polymer Preprints, 50(2), 195 - 196 (2009).

443. "Covalent Grafting of Well-Defined Polymers on Multi-Walled Carbon Nanotubes", D. Baskaran and J. W. Mays, invited talk at the International Conference on Carbon-Nanostructured Materials (Cnano '09), Santorini, Greece, October 4 – 8, 2009.

444. "Functionalization of Multi-walled Carbon Nanotubes by Combinations of Living Anionic, Ring Opening and Atom Transfer Surface Initiated Polymerization", D. Priftis, G. Sakellariou, N. Hadjichristidis, D. Baskaran, and J. W. Mays, poster presentation at the International Conference on Carbon-Nanostructured Materials (Cnano '09), Santorini, Greece, October 4 – 8, 2009.

445. "Use of a Microfluidic Chip to Obtain Viscosity Results Over a Wide Shear Rate Range for Solutions of Polypeoptide-Modified Hyaluronic Acid Chains or Actin Protein Fibers", M. Kandadai, J. J. Magda, J. W. Mays, et al., presented at the Society of Rheology Meeting, Madison, WI, October 21, 2009.

446. "Graft Copolymers: From Fundamental Research to Real World Applications", J. W. Mays, ACS Southern Chemist Award Address, Memphis, TN, December 3, 2009.

447. "Covalent Grafting of Polymers from Carbon Nanotubes", D. Baskaran and J. W. Mays, invited presentation at the ACS Composite Matrix Science Workshop, New Orleans, LA, February 8 – 9, 2010.

448. "Dilute Solution Properties and Branching Analysis of Polymers by Multi-Detector SEC", J. Mays, invited Exhibitor Seminar, Pittcon, Orlando, FL, March 1, 2010.

449. "Dilute Solution Properties and Branching Analysis of Polymers by Multi-Detector SEC", J. Mays, invited Exhibitor Seminar, Pittcon, Orlando, FL, March 2, 2010.

450. "Novel Polymer Membranes with Charged and Hydrophilic Pathways", J. W. Mays and S. Deng, presented at the Tennessee Technology Development Corporation Meeting, Nashville, TN, May 10-11, 2010.

451. "Novel Polymeric Materials Based on Poly(1,3-Cyclohexadiene)", J. W. Mays, invited presentation at the Frontiers of Polymer Science Symposium held in honor of the Retirement of Professor Roderick Quirk, University of Akron, Akron, OH, May 13-14, 2010.

452. "An Approach to Evaluate the Stress-Strain and Hysteresis Behaviour of Thin and Transparent Elastomer Films at High Strains", R. Schlegel, R. Weidisch, N. Hadjichristidis, J. W. Mays, H. Lorenz, and G. Heinrich, presented at the Symposium on Nanostructured Polymers/Nanocomposites, University of Halle, Halle, Germany, May 18 – 19, 2010.

453. "Tailored Synthesis and Characterization of Complex Polymers", J. W. Mays, invited presentation in the Short Course on Techniques for Polymer Analysis and Characterization", 23rd International Symposium on Polymer Analysis and Characterization (ISPAC), Pohang, South Korea, May 30, 2010.

454. "Synthesis and Characterization of Model Star-Branched Polyelectrolytes", D. W. Holley and J. W. Mays, poster presentation at the 23rd International Symposium on Polymer Analysis and Characterization (ISPAC), Pohang, South Korea, May 31 – June 2, 2010.

455. "Superelastomers Based on Branched Block Copolymers", J. W. Mays, invited

presentation at Guangju Institute for Science and Technology (GIST), Guangju, South Korea, June 3, 2010.

456. "Superelastomers Based on Branched Block Copolymers", J. W. Mays, invited presentation at Pusan National University, Busan, South Korea, June 4, 2010.

457. "Novel Polymeric Materials Based on Poly(1,3-Cyclohexadiene)", J. W. Mays, invited presentation at Dow Chemical, Freeport, TX, July 29, 2010.

458. "Synthesis and Characterization of Star-Shaped Sodium Poly(Styrene sulfonate) by Atom transfer radical Polymerization of Ethyl Styrene Sulfonate", Y. Li, X. Yu, J. Mays, and K. Hong, presented at the National Meeting of the American Chemical Society, Boston, MA, August 22-26, 2010; see also Polymer Preprints, 51(2), 261-262 (2010).

459. "Electrical Properties and Nanomorphology of Well-Defined Conjugated Polymer Brushes", J. Chen, J. Alonzo, X. Yu, K. Hong, J. M. Messman, I. Ivanov, H. M. Meyer III, M. Banerjee, R. Rathore, J. W. Mays, and S. M. Kilbey II, presented at the National Meeting of the American Chemical Society, Boston, MA, August 22-26, 2010; see also Polymeric Materials: Science & Engineering, 103, 452 – 453 (2010).

460. "Synthesis and Characterization of Block Copolymers with Polythiophene Segments by the Combination of Atom Transfer Radical Polymerization and Kumada Catalyst-Transfer Polycondensation", X. Yu, Y. Li, H. M. O'Neil, S. M. Kilbey II, J. W. Mays, P. F. Britt, and K. Hong, presented at the National Meeting of the American Chemical Society, Boston, MA, August 22-26, 2010; see also Polymeric Materials: Science & Engineering, 103, 532 - 534 (2010).

461. "Ternary Phase Behavior of P3HT-b-PEO Compatibilized P3HT/PCBM Films", J. Chen, X. Yu, K. Hong, J. M. Messman, D. L. Pickel, K. Xiao, B. Sumpter, M. D. Dadmun, J. W. Mays, and S. M. Kilbey II, presented at the National Meeting of the American Chemical Society, Boston, MA, August 22-26, 2010; see also Polymeric Materials: Science & Engineering, 103, 441 - 442 (2010).

462. "Semifluorinated Amphiphilic Block Copolymers from Poly(isoprene-b-ethylene oxide) Copolymer Precursors", E. Kaditi, S. Pispas, K. Hong, and J. W. Mays, presented at the 6th International Conference on Modification, Degradation, and Stabilization of Polymers, Athens, Greece, September 5-9, 2010.

463. "Influence of Interface and Morphology on Mechanical Properties of Thermoplastic Elastomers with Complex Molecular Architectures", R. Schlegel, Y. Duan, R. Weidisch, J. W. Mays, N. Hadjichristidis, H. W. Siesler, and M. Stamm, presented at the 24th Cpnference of the European Colloid and Interface Society (ECIS), Prague, Czech Republic, September 5-10, 2010.

464. "High Performance Proton Conducting Membranes for Fuel Cells", J. Mays, presented at

the Energy Partnership Forum, University of Tennessee, Knoxville, September 8, 2010.

465. "P3HT Block Polymers: Synthesis and Charge Mobility", X. Yu, K. Xiao, J. Chen, S. M. Kilbey II, J. W. Mays, P. F. Britt, and K. Hong, poster presentation at the Center for Nanophase Materials Sciences User Meeting, Oak Ridge, TN, September 14, 2010.

466. "Patterning and Optoelectrical Properties of Poly(para-phenylene) Brushes", J. Chen, J. Alonzo, X. Yu, K. Hong, J. Messman, I. Ivanov, H. M. Meyer III, M. Banerjee, R. Rathore, N. V. Lavrik, J. W. Mays, and S. M. Kilbey II, poster presentation at the Center for Nanophase Materials Sciences User Meeting, Oak Ridge, TN, September 14, 2010.

467. "Efficiency of Physical Crosslinking in Multigraft and Block-Graft Copolymers", R. Schlegel, R. Weidisch, N. Hadjichristidis, J. W. Mays, M. Kluppel, and G. Heinrich, presented at Polymeric Materials P.2010 Conference, Halle, Germany, September 15 – 17, 2010.

468. "Super-Elastomers from Multigraft Block Copolymers", J. W. Mays, invited presentation at Department of Chemistry, Wright State University, Dayton, OH, September 17, 2010.

469. "Novel Polymeric Materials Based on Poly(1,3-cyclohexadiene)", J. Mays, invited presentation at the Army Research Laboratory, Aberdeen, MD, September 21, 2010.

470. "Control of Molecular Architecture in Block Copolymers: Routes to Super-Elastomers", J. W. Mays, invited presentation at Department of Chemistry, University of West Florida, Pensacola, FL, October 15, 2010.

471. "Synthesis, Morphology and Properties of Branched Block Copolymers", J. W. Mays, invited presentation at the 8th Hellenic Polymer Society Symposium on Polymer Science and Technology, Hersonissos, Crete, Greece, October 24 - 29, 2010.

472. "Unusual Copolymerization Behavior of Living Poly(4-Vinylbenzocyclobutene) Anions in Non-Polar Solvents", P. Driva, J. W. Mays, and D. Baskaran, invited presentation at the 8th Hellenic Polymer Society Symposium on Polymer Science and Technology, Hersonissos, Crete, Greece, October 24 - 29, 2010.

473. "Multigraft Copolymers as Superelastic Materials – Influence of Molecular Architecture and Morphology", R. Schlegel, S. Holzer, R. Weidisch, N. Hadjichristidis, D. Uhrig, and J. W. Mays, invited presentation at the 8th Hellenic Polymer Society Symposium on Polymer Science and Technology, Hersonissos, Crete, Greece, October 24 - 29, 2010.

474. "General Route for Surface Polymer Grafting On Carbon Nanotubes", G. Sakellariou, D. Priftis, M. Gkikas, D. Baskaran, M. Pitsikalis, H. Iatrou, J. Mays, N. Hadjichristidis, poster presentation at the 8th Hellenic Polymer Society Symposium on Polymer Science and Technology, Hersonissos, Crete, Greece, October 24 - 29, 2010.

475. "Synthesis, Molecular and Morphological Characterization of Linear Triblock Terpolymers where One of the Blocks is Poly(Cyclohexadiene)", K. Misichronis, S. Rangou, E. Ashcroft, J. W. Mays, and A. Avgeropoulos, poster presentation at the 8th Hellenic Polymer Society Symposium on Polymer Science and Technology, Hersonissos, Crete, Greece, October 24 - 29, 2010.

476. "Fluorinated and Sulfonated Block Copolymers: Synthesis and Self-Assembly in Aqueous Solution", X. Wang, K. Hong, and J. W. Mays, oral presentation at the Macromolecular Materials Gordon Research Symposium, January 8 – 9, 2011, Ventura, CA.

477. "Fluorinated and Sulfonated Block Copolymers: Synthesis and Self-Assembly in Aqueous Solution", X. Wang, K. Hong, and J. W. Mays, poster presentation at the Macromolecular Materials Gordon Research Conference, January 9 – 14, 2011, Ventura, CA.

478. "Superelastomers™: New Thermoplastic Elastomers based on Multigraft Copolymers", J. Mays, presented at the Tennessee Next Conference, Nashville, TN, May 5-6, 2011.

479. "Unusual Morphologies in Fluorinated and Sulfonated block Copolymers", J. W. Mays, X. Wang, T. Huang, S. P. Gido, B. Sumpter, M. Goswami, poster presentation at the International Symposium on Polymer Analysis and Characterization, Torino, Italy, June 6 – 8, 2011.

480. "Effect of Block Composition and Molecular Weight on the Structure of Donut-Shaped Micelle", J. Jung, T. Chang, H. Huang, M. S. Rahman, J. Mays, poster presentation at the International Symposium on Polymer Analysis and Characterization, Torino, Italy, June 6 – 8, 2011.

481. "Characterizing Complex Architectures: Is GPC Adequate?", M. S. Rahman, H. Lee, X. Chen, T. Chang, R. Larson, and J. Mays, invited presentation at International Symposium on Ionic Polymerization, IP"11, Akron, OH, July 10 – 15, 2011.

482. "Synthesis and Characterization of Symmetric and Asymmetric H-Shaped Polybutadiene", poster presentation at International Symposium on Ionic Polymerization, IP"11, Akron, OH, July 10 – 15, 2011.

483. "Past, Present, and Future of SEC for Characterizing Polymers", J. Mays, invited talk at the Advanced Polymer Characterization Workshop, American Chemical Society National Meeting, Denver, CO, August 28 – September 1, 2011.

484. "Keeping Anionic Polymerization Alive After Fifty Years", J. W. Mays, Herman F. Mark Senior Scholar Award Address, American Chemical Society National Meeting, Denver, CO, August 28 – September 1, 2011.

485. "Control of Molecular Architecture in Block Copolymers: Routes to Superelastomers", J. Mays, Award Address, 2011 Outstanding Alumni Award, Department of Polymer Science, University of Akron, Akron, OH, October 7, 2011.

486. "Combined Synthesis, TGIC Characterization, and Rheological Study of "H" Polybutadienes, including the Effects of Synthetic Impurities", R. G. Larson, X. Chen, H. Lee, T. Chang, S. Rahman, J. Mays, presented at the Society of Rheology Meeting, Cleveland, OH, October 9-13, 2011.

487. "Control of Molecular Architecture in Block Copolymers: Routes to Superelastomers", J. Mays, invited lecture at Chinese Academy of Sciences, Beijing, China, October 13, 2011.

488. "Multi-Scale Models for Poly(1,3-cyclohexadiene) (PCHD) Polymer, Q. Wang, D. J. Keffer, S. Deng, and J. W. Mays, presented at the AIChE Meeting, Minneapolis, MN, October 16 – 21, 2011.

489. "Control of Molecular Architecture in Block Copolymers: Routes to Superelastomers", J. Mays, invited lecture at Roanoke Collge, Salem, VA, November 18, 2011.

490. "Superelastomers: New Thermoplastic Elastomers from Multigraft Copolymers", J. Mays, invited presentation, Nashville Section ACS, Belmont University, Nashville, TN, January 24, 2012.

491. Y. Chen, X. Wang, K. Zhang, K. Wooley, J. Mays, V. Percec, D. Pochan, presented at the American Physical Society Meeting, February 27 – March 2, 2012, Boston, MA. See also Bulletin of American Physical Society, 2012, 49, C1.

492. "Morphology of Charged Block Copolymers of Fluorinated Isoprene and Sulfonated Styrene", X. Wang, J. Chen, K. Hong, M Goswami, B. Sumpter, and J. W. Mays, invited presentation at the National ACS Meeting, San Diego, CA, March 25 – 29, 2012. See also Polymer Preprints, 53(1), 23 – 24 (2012).

493. "Microstructure Effects on Self-Assembly of Polystyrene-b-Sulfonated polycyclohexadiene", X. Wang, H. Burrell, K. Hong, M. Kilbey, J. W. Mays, presented at the National ACS Meeting, San Diego, CA, March 25 – 29, 2012. See also Polymer Preprints, 53(1), 463 - 464 (2012).

494. "Thermal Stability of Fluorinated Polydienes Synthesized by Addition of Difluorocarbene", T. Huang, X. Wang, T. Malmgren, K. Hong, and J. W. Mays, presented at the 2012 TA Instruments User Meeting and Symposium, April 29 – May 2, 2012, New Orleans, LA.

495. "Structure, Thermal, and Rheological Properties of Polymer Composites Incorporating

Crosslinked Polymer Nanoparticles", D. Baskaran, D. W. Holley, M. Ruppel, V. Urban, and J. W. Mays, invited presentation at the 2012 TA Instruments User Meeting and Symposium, April 29 – May 2, 2012, New Orleans, LA.

496. "Rheology as a Method of Inferring Long-Chain Branching", R. G. Larson, M. S. Rahman, H. Lee, J. Mays, T. Chang, and X. Chen, invited presentation at the IUPAC World Polymer Congress, Blacksburg, VA, June 24 – 29, 2012.

497. "Thermal Stability of Fluorinated Polydienes Synthesized by Addition of Difluorocarbene", T. Huang, X. Wang, T. Malmgren, K. Hong, and J. W. Mays, presented at the 25 International Symposium on Polymer Analysis and Characterization, Rolduc Abbey, Kerkrade, The Netherlands, June 10 – 13, 2012.

498. "Structure, Thermal, and Rheological Properties of Polymer Composites Incorporating Crosslinked Polymer Nanoparticles", D. Baskaran, D. W. Holley, M. Ruppel, V. Urban, and J. W. Mays, presented at the 25 International Symposium on Polymer Analysis and Characterization, Rolduc Abbey, Kerkrade, The Netherlands, June 10 – 13, 2012.

499. "Structure, Thermal, and Rheological Properties of Polymer Composites Incorporating Crosslinked Polymer Nanoparticles", D. Baskaran, D. W. Holley, M. Ruppel, V. Urban, and J. W. Mays, invited presentation at the Department of Materials Science and Engineering, University of Ioaninna, Ioaninna, Greece, June 19, 2012.

500. "Polymer-Based Multicomponent Materials: Research on Multiblock Copolymers", P. Driva, C. Dyer, F. Bates, M. Dadmun, B. Sumpter, M. Goswami, S. Sides, R. Kumar, J. Mays, presented at the Material Chemistry Principal Investigators' Meeting – 2012, July 15 – 18, 2012, Annapolis, MD.

501. "Polymer-Based Multicomponent Materials: Research on Nanocomposites", M. Ruppel, V. Urban, K. Schweizer, M. Dadmun, B. Sumpter, D. Baskaran, J. Mays, presented at the Material Chemistry Principal Investigators' Meeting – 2012, July 15 – 18, 2012, Annapolis, MD.

502. "Kinetic Control of Block Copolymer Self-Assembly into Multicompartment and Novel Geometry Nanoparticles", Y. Chen, X. Wang, J. Mays, K. Zhang, K. Wooley, and D. J. Pochan, presented at the American Chemical Society National Meeting, Philadelphia, PA, August 19 -23, 2012. See also: Polymeric Materials: Science and Engineering, 107, 353 (2012).

503. "Piezoelectric Properties of Non-Polar Block Copolymers", V. Urban, M. Ruppel, C. V. Pester, J. Mays, and A. Boeker, presented at the Meeting of the American Crystallographic Association, Boston, MA, July 28 – August 1, 2012.

504. "Complex Block Copolymers: Branching, Charges, and Stiffness", J. W. Mays, presented at Dow Electronic Chemicals, Marlborough, MA, August 24, 2012.

505. "Polymer Synthesis at and Beyond the Limits of Characterization: Limitations of SEC", J. W. Mays, invited Keynote Speaker, NIST Workshop on Macromolecular Separations-By-Design, Gaithersburg, MD, October 10 – 11, 2012.

506. "Branched Block Copolymers: Routes to Superelastomers", J. W. Mays, invited lecture at Northwestern Polytechnical University, Xi'an, China, November 13, 2012.

507. "Limitations of GPC as a Polymer Characterization Tool", J. W. Mays, invited lecture at Northwestern Polytechnical University, Xi'an, China, November 14, 2012.

508. "Broken Affinity in Near-Critical Block Copolymer Solutions in the Presence of an Electric Field", M. Ruppel, C. W. Pester, V. S. Urban, J. W. Mays, and A. Boeker, presented at the SAS 2012 International Small-Angle Scattering Conference, November 18 – 23, 2012, Sydney, Australia.

509. "Optimization of Macromolecular Architecture in Styrene/Diene Block Copolymer Thermoplastic Elastomers", J. W. Mays, S. Gido, R. Weidisch, invited lecture at the DYNACOP Final Conference on Dynamics of Architecturally Complex Polymers: Current and Future Trends, Leeds, England, December 12-14, 2012.

510. "Kinetic Control of Block Copolymer Self-Assembly Into Multicompartment and Novel Geometry Nanoparticles", Y. Chen, X. Wang, K. Zhang, K. L. Wooley, J. W. Mays, and D. J. Pochan, poster presentation at the Gordon Research Conference on Macromolecular Materials, Ventura, CA, January 6 – 10, 2013.

511. "Optimization of Macromolecular Architecture in Styrene/Diene Block Copolymer Thermoplastic Elastomers", J. W. Mays, invited lecture at Tennessee Tech University, Department of Chemistry, February 22, 2013.

512. "Optimization of Macromolecular Architecture in Styrene/Diene Block Copolymer Thermoplastic Elastomers", J. W. Mays and Samuel P. Gido, invited lecture at Case Western Reserve University, March 8, 2013.

513. "Lignin Based Carbon Fiber Precursors", Ildoo Chung, Taeyoon Kim, and Jimmy Mays, invited presentation at the ACS National Meeting, New Orleans, LA, April 7 – 11, 2013.

514. "Polymer Synthesis at and Beyond the Limits of Characterization: Limitations of SEC", J. W. Mays, invited lecture at the 25th Anniversary Symposium, College of Polymer Science and Polymer Engineering, University of Akron, Akron, OH, May 9 – 10, 2013.

515. "Optimization of Macromolecular Architecture in Styrene/Diene Block Copolymer Thermoplastic Elastomers", Jimmy Mays, invited presentation at Fraunhofer-Institut für Werkstoffmechanik, Halle, Germany, July 11, 2013.

516. "Covalent Grafting of Polymers from Carbon Nanotubes", J. Mays, invited presentation at NASA Glenn Research Center, Clevelend, OH, July 29, 2013.

517. "Covalent Grafting of Polymers from Carbon Nanotubes", J. Mays, invited presentation at the National Meeting of the American Chemical Society, Indianapolis, IN, September 8 – 12, 2013.

518. "Synthesis and Characterization of Symmetric and Asymmetric H Polybutadienes: Limitations of SEC", J. Mays, invited presentation at the National Meeting of the American Chemical Society, Indianapolis, IN, September 8 – 12, 2013.

519. "Impact of Microstructure on Self-assembly of PCHD-based Rod-Coil Diblock Copolymers in Solution and Thin Films", K. Bornani, J. W. Mays, and S. M. Kilbey, presented at the National Meeting of the American Chemical Society, Indianapolis, IN, September 8 – 12, 2013.

520. "Solution Properties of Self-assembled Mixtures of Complex Block Copolymers from a Blended State", J. Davis, X. Wang, J. P. Hinestroza, J. W. Mays, and S. M. Kilbey, presented at the National Meeting of the American Chemical Society, Indianapolis, IN, September 8 – 12, 2013.

521. "Control of Structure in Self-assembled Films through Architecturally and Compositionally Complex Block Copolymer Surfactant Mixtures", X. Wang, J. Davis, J. P. Hinestroza, J. W. Mays, and S. M. Kilbey, presented at the National Meeting of the American Chemical Society, Indianapolis, IN, September 8 – 12, 2013.

522. "Long-Chain Branching Characterized by Advanced Chromatographic and Rheological Methods", R. G. Larson, X. Chen, T. Costeux, H. Lee, M. S. Rahman, T. Chang, and J. W. Mays, invited talk at the KAUST Polymer Conference: From Synthesis to Properties and Applications, November 9-13, 2013, Thuwal, Saudi Arabia.

523. "Synthesis and Characterization of Asymmetric H-Shaped Polybutadienes", M. S. Rahman, H. Lee, T. Chang, and J. Mays, invited talk at the KAUST Polymer Conference: From Synthesis to Properties and Applications, November 9-13, 2013, Thuwal, Saudi Arabia.

524. "Macromolecular Architectures and Polymer Characterization", J. Mays, invited Plenary Lecture at the 1st Annual APTEC Conference, Department of Polymers and High Performance Materials, University of Southern Mississippi, November 22, 2013, Hattiesburg, MS.

525. "Macroscopic Tailoring of Two-Dimensional Layered Hexagonal Materials Using Simple Redox-Liquid Exfoliation", V. K. Srivastava, R. A. Quinlan, A. L. Agapov, K. M. Nelson, A. P. Sokolov, G. S. Bhat, and J. W. Mays, presented at the 2013 Materials Research Society Fall Meeting, Dec. 1 – 6, Boston, MA.

526. "The Impact of Nanoparticle Size on Polymer Dynamics in Nanocomposites", A. Imel, B. Miller, W. Holley, D. Baskaran, J. Mays, and M. Dadmun, presented at the 2013 Materials Research Society Fall Meeting, Dec. 1 – 6, 2013, Boston, MA.

527. "Changing the World with Polymers", J. Mays, invited talk, UT Science Forum, January 24, 2014.

528. "Synthesis and Characterization of Functional Polymers bearing Amino-triazine Functionality", Adam Douglas, Nikhil Singha, Jimmy Mays, Mark Dadmun, poster presentation at the 2014 Southeast Undergraduate Research Conference, January 30 – 31, 2014, Knoxville, TN.

529. "Synthesis and Characterization of New Thermoplastic Elastomers Based on Polybenzofulvene", Tyler White, Weiyu Wang, Namgoo Kang, and Jimmy Mays, oral presentation at the 2014 Southeast Undergraduate Research Conference, January 30 – 31, 2014, Knoxville, TN.

530. "Optimizing Block Copolymer Architecture", J. Mays, invited plenary lecture, 2014 Southeast Undergraduate Research Conference, January 30 – 31, 2014, Knoxville, TN.

531. "Rational Design of Multiblock Copolymers for Thermoplastic Elastomers:", J. W. Mays, invited presentation at East Tennessee State University, March 28, 2014, Johnson City, TN.

532. "Effect of Macromolecular Architecture on Morphology and Mechanical Properties of Block Copolymers", J. W. Mays, S. Gido, and R. Weidisch, invited presentation at Goodyear Tire & Rubber Company, May 30, 2014, Akron, OH.

533. "Effect of Macromolecular Architecture on Morphology and Mechanical Properties of Block Copolymers", J. W. Mays, S. Gido, and R. Weidisch, invited presentation at Kraton Polymers, June 3, 2014, Houston, TX.

534. "Effect of Macromolecular Architecture on Morphology and Mechanical Properties of Block Copolymers", J. W. Mays, S. Gido, and R. Weidisch, invited presentation at Soochow University, Department of Chemistry, Chemical Engineering, and Materials Science, July 1, 2014, Suzhou, China.

535. "H Polymers – Limitations of SEC", J. W. Mays, invited presentation at Soochow University, Department of Chemistry, Chemical Engineering, and Materials Science, July 1, 2014, Suzhou, China.

536. "Modern Challenges in Polymer Characterization: Limitations of SEC", J. W. Mays, invited presentation at Nanjing University, July 3, 2014, Nanjing, China.

537. "Synthesis and Characterization of New Thermoplastic Elastomers Based on Polybenzofulvene", W. Wang, A. Goodwin, T. White, X. Lu, N. Kang, and J. Mays, invited presentation at Northwestern Polytechnical University, July 4, 2014, Xi'an, China.

538. "Effect of Macromolecular Architecture on Morphology and Mechanical Properties of Block Copolymers", J. W. Mays, S. Gido, and R. Weidisch, invited presentation at East China University of Science and Technology, July 7, 2014, Shanghai, China.

539. "Optimization of Macromolecular Architecture in Styrene/Diene Block Copolymer Thermoplastic Elastomers", Samuel P. Gido and Jimmy Mays, invited presentation at Fraunhofer-Institut für Werkstoffmechanik, Halle, Germany, August 7, 2014.

540. "Synthesis and Characterization of New Thermoplastic Elastomers based on Polybenzofulvene", Weiyu Wang, Tyler White, Andrew Goodwin, Xinyi Lu, Namgoo Kang, and Jimmy Mays, presented at the ACS National Meeting, San Francisco, CA, August 12, 2014.

541. "Development of Passive Polymer Membranes for Carbon Dioxide Separation", Zhenbin Niu, Shannon Mahurin, De-en Jiang, Brian Long, Jimmy Mays, Alexei Sokolov, and Tomonori Saito, presented at the ACS National Meeting, San Francisco, CA, August 14, 2014.

542. "Structure of Poly(L-lactic acid) Gel formed by Complex Crystals with Solvents", Yasuhiro Matsuda, Akinobu Fukatsu, Kazuaki Miyamoto, Jimmy W Mays, and Shigeru Tasaka, presented at the ACS National Meeting, San Francisco, CA, August 10, 2014.

543. "Relationship between Ionic Transport and Segmental Relaxation in Polymer Electrolytes", Yangyang Wang, Fei Fan, Alexander Agapov, Tomonori Saito, Jun Yang, Xiang Yu, Kunlun Hong, Jimmy Mays, and Alexei Sokolov, presented at the ACS National Meeting, San Francisco, CA, August 12, 2014.

544. "Advances in Thermoplastic Elastomers", J. Mays, invited lecture at Department of Chemistry, University of Alabama at Birmingham, September 18, 2014.

545. "Gelation Mechanism and Gel Structure of Poly(L-lactic acid) Induced by Complex Crystallization with Solvents", Y. Matsuda, A. Fukatsu, Y. Wang, K. Miyamoto, J. W. Mays, and S. Tasaka, presentation at the Society of Rheology of Japan, National Meeting, October 17, 2014.

546. "Thermoplastic Elastomers Based on Benzofulvene: An Elastomer with a Higher and Tunable Upper Service Temperature", Weiyu Wang, Tyler White, Andrew Goodwin, Xinyi Lu, Nam-Goo Kang, and Jimmy Mays, invited poster presentation at the Macromolecular Materials Gordon Research Conference, Ventura, CA, January 11 – 15,

2015.

547. "Synthesis and Characterization of Thermoplastic Elastomers based on Benzofulvene", W. Wang and J. Mays, presented at the Department of Polymer Science and Engineering, University of Massachusetts, Amherst, MA, February 23, 2015.

548. "Characterization of Novel High Temperature Thermoplastic Elastomers Polybenzofulvene-block-Polyisoprene-b-Polybenzofulvene", J. W. Mays, W. Wang, T. White, N. Kang, K. Hong, R. Schlegel, M. Beiner, K. Williams, and S. P. Gido, invited lecture at the National Meeting of the American Chemical Society, Denver, CO, March 22-26, 2015.

549. "Synthesis, Morphological Behavior, and ODT of Poly(cyclohexadiene)-Based Copolymers", K. Misichronis, J. Chen, K. J. Kahk, A. Imel, M. D. Dadmun, J. G. Kennemur, F. S. Bates, J. W. Mays, K. Hong, and A. T. Avgeropoulos, presented at the National Meeting of the American Chemical Society, Denver, CO, March 22-26, 2015.

550. "Improved Carbon Nanotube Fibers through Crosslinking and Surface Modification", R. Ripy, X. Lu, N. Kang, and J. W. Mays, presented at the National Meeting of the American Chemical Society, Denver, CO, March 22-26, 2015.

551. "Synthesis of Passive Polymer Membranes for CO_2 Separation", S. Chatterjee, T. Hong, S. M. Mahurin, J. W. Mays, A. P. Sokolov, and T. Saito, presented at the National Meeting of the American Chemical Society, Denver, CO, March 22-26, 2015.

552. "Energy Filtered TEM for Element Specific Imaging of New Poly(isoprene-b-benzofulvene) Block Copolymers", S. P. Gido, K. Williams, B. Coughlin, W. Wang, and J. W. Mays, invited lecture at the National Meeting of the American Chemical Society, Denver, CO, March 22-26, 2015.

553. "New High Temperature Thermoplastic Elastomers Based on Polybenzofulvene", J. W. Mays, W. Wang, T. White N. Kang, and K. Hong, invited lecture at the National Meeting of the American Chemical Society, Denver, CO, March 22-26, 2015.

554. "Effect of Cross-Link Density on Carbon Dioxide Separation in PDMS Norbornene Membranes", Tao Hong, Zhenbin Niu, Shannon Mahurin, De-en Jiang, Brian Long, Jimmy Mays, Alexei Sokolov, and Tomonori Saito, 249th ACS National Meeting & Exposition, Denver, CO, United States, March 22-26, 2015.

555. "New High Temperature Thermoplastic Elastomers Based on Poly(benzofulvene) Hard Blocks", J. W. Mays, invited lecture at the T.W. Bennett Symposium, University of Southern Mississippi, Hattiesburg, MS, April 17, 2015.

556. "Atomic Force Microscopy of Renatured Xanthan with Low Molar Mass", Yasuhiro Matsuda, Fumitada Sugiura, Jimmy Mays, Shigeru Tasaka, presented at The Society of

Polymer Science Meeting, May 2015.

557. "Characterization of a New High Temperature Thermoplastic Elastomer Synthesized by Living Anionic Polymerization in Hydrocarbon Solvent at Room Temperature", W. Wang, R. Schlegel, T. White, N.-G. Kang, M. Beiner, and J. Mays, presented at the 28th International Symposium on Polymer Analysis and Characterization (ISPAC), Houston, Texas, June 8 – 10, 2015.

558. "Unique Three-Phase Self-Assembly and Order-Disorder Transition of Poly(cyclohexadiene)-Based Copolymers", K. Misichronis, J. Chen, A. Imel, R. Kumar, M. Dadmun, J. Kennemur, F. S. Bates, K. Hong, J. Thostenson, B. G. Sumpter, J. W. Mays, and A. Avgeropoulos, presented at the 28th International Symposium on Polymer Analysis and Characterization (ISPAC), Houston, Texas, June 8 – 10, 2015.

559. "Mechanical Properties of All-Acrylic Graft Copolymers Synthesized Via the Grafting Through Approach", A. Goodwin, W. Wang, N.-G. Kang, Y. Wang, K. Hong, and J. Mays, presented at the 28th International Symposium on Polymer Analysis and Characterization (ISPAC), Houston, Texas, June 8 – 10, 2015.

560. "Overview of Superelastomers Technology", J. Mays, presented at Zeon Chemicals, Louisville, KY, August 7, 2015.

561. "All-Acrylic Multigraft Copolymers: Synthesis, Characterization, and Mechanical Behavior Based on Side Chain Composition", A. Goodwin, W. Wang, N.-G. Kang, Y. Wang, K. Hong, and J. Mays, presented at Zeon Chemicals, Louisville, KY, August 7, 2015.

562. "High Temperature Thermoplastic Elastomer Synthesized by Living Anionic Polymerization in Hydrocarbon Solvent at Room Temperature", W. Wang, R. Schlegel, T. White, M. Beiner, N.-G. Kang, and J. Mays, presented at Zeon Chemicals, Louisville, KY, August 7, 2015.

563. "Synthesis and Characterization of New Thermoplastic Elastomers with Tunable Upper Service Temperatures Containing Polybenzofulvene", T. White, W. Wang, N.-G. Kang, and J. Mays, presented at the National Meeting of the American Chemical Society. Boston, MA, August 16 – 20, 2015.

564. "Synthesis and Characterization of Polyacrylates with Different Pendant Groups for Thermoplastic Elastomers", W. Lu, N.-G. Kang, K. Hong, and J. Mays, presented at the National Meeting of the American Chemical Society. Boston, MA, August 16 – 20, 2015.

565. "Characterization of Long-Chain Branching by SEC with MW/Size Sensitive Detectors", J. W. Mays, presented at the GPC 2015 Short Course, August 31, 2015, Washington, DC.

566. "Polymer Synthesis At and Beyond the Limits of Characterization", Jimmy Mays, invited Keynote Lecture, presented at GPC 2015, September 1 – 3, 2015, Washington, DC.

567. "Careers in Polymer Chemistry", J. Mays, presented to the Student Associates of the American Chemical Society, University of Tennessee, October 21, 2015.

568. "Failure of Tube Models to Predict the Linear Rheology of Star/Linear Blends", R. Hall, P. Desai, B. Kang, M. Katzarova, Q. Huang, S. Lee, T. Chang, D. Venerus, J. Mays, and R. Larson, to be presented at the National Meeting of the American Physical Society, March 14-18, 2016. Baltimore, MD.

569. "Challenging Slip-Link Models: Predicting the Linear Rheology of 1,4-Polybutadiene Blends of Well-Characterized Star and Linear 1,4-Polybutadienes, M. Katzarova, Priyanka Desai, B. Kang, R. Hall, Q. Huang, S. Lee, T. Chang, D. Venerus, J. Mays, J. Schieber, and R. Larson, to be presented at the National Meeting of the American Physical Society, March 14-18, 2016. Baltimore, MD.

Past and Present Students, Postdocs, and Visiting Scientists:
Jian Zhou, Donna Frater, Stergios Pispas, Brad Bishop, Steve Harville, Dan Cook, Jianbo Li, Yuan-Ju (Ray) Chen, Yunan Wan, Lujia Bu, Jinchuan Yang, David Uhrig, Kunlun Hong, Marinos Pitsikalis, Rozalia Mandras, Yiannis Poulos, Stella Sioula, Hermis Iatrou, Stella Paraskeva, Howard Bowman, Jonathan Woodward, Helen Ji, Anthony Karandinos, Dong Xie, Wei Wu, Walter Cristofoli, Qingye Zhou, Yingfan Wang, Brandon Farmer, Durairaj Baskaran, Manisha Chakraborty, Hongwei Zhang, Meichun Li, Wade Holley, Ming Liu, Georgios Sakellariou, Dimitris Pantazis, Theodoros Tsoukatos, Nick DePriest, Ravi Aggarwal, Ildoo Chung, Joseph Pickel, Jamie Messman, Hongliang Zhou, Xiao Ma, Apostolos Avgeropoulos, Tianzi Huang, Grigoris Mountrichas, Thrasyvoulos Aliferis, Xiang Yu, Suxiang Deng, Carlos de Anda, M. S. Rahman, Lihong He, Xiaojun Wang, Yu-Gang Li, Paraskevi Driva, Sachin Bobade, Justin Roop, Markus Ruppel, Vikram Srivastava, Christopher Hurley, Andrew Goodwin, Eui Soung Jang, Jun Yang, Konstantinos Misichronis, Weiyu Wang, Sang-Woog Ryu, Nam-Goo Kang, Beom-Goo Kang, Xinyi Lu, Wei Lu, Adam Douglas, Tyler White, Hongbo Feng, Benjamin Ripy, Yuya Doi, Nikhil Singha, Yasuhiro Matsuda, Huiqun Wang, Maria Cecilia Evora, Arindam Chakrabarty, Priyank Shah.